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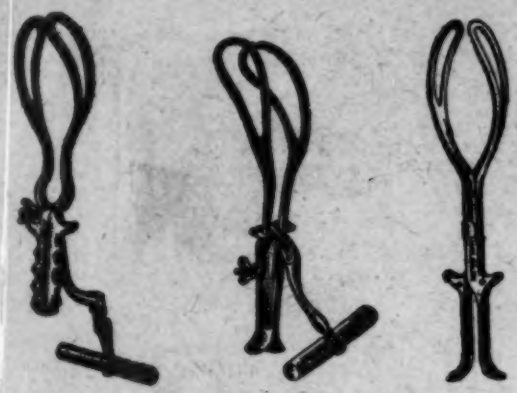

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 23 1955

# THE INTEGRATION OF MEDICINE

## THE ENDEAVOUR OF THOMAS LINACRE AND ITS PRESENT SIGNIFICANCE*

BY

**Sir HAROLD HIMSWORTH, K.C.B., M.D., LL.D., F.R.C.P., F.R.S., Q.H.P.**

*Secretary of the Medical Research Council*

To be invited to deliver the Linacre Lecture is at once an honour and a responsibility. I am, of course, aware that this is no memorial lecture. Linacre himself, in providing for its endowment, was singularly free from that failing, so prevalent in his age, of desiring to sustain his reputation in the minds of future generations. He was content with a greater aim—to provide for the better dissemination of medical learning. And it has been the willing task of many of my predecessors to fulfil his wishes by contributing liberally from their own special knowledge.

Yet one cannot help being interested in a man who made such a lasting impression on learning in this country; for it is, I think, a safe deduction that a reputation which can survive the passage of more than four centuries must have been based upon a life of more than usual significance. Each generation has its own perplexities, and with the passage of time the social context and the philosophic idiom in which these are expressed alter so greatly that for later ages the particular problems which faced their predecessors have, at first sight, little more than the picturesque unreality of the costumes in a Holbein painting. Yet human nature changes relatively slowly, and if we can pierce the haze of history we may still draw lessons of profit to ourselves from the success or failure of our predecessors to appreciate and to deal with the issues of their day.

It is this theme that I wish to develop. In what lay the significance of Linacre's work? Can we find in his endeavours lessons of relevance to our own situation?

### Linacre's Career

The facts about Thomas Linacre's life, although meagre, are well known. He was born at Canterbury, probably in the year 1460, and died on October 20, 1524. He was educated at Oxford, where he became a Fellow of All Souls, and was one of that small band of men who were there developing the study of Greek. Among his pupils was the future Sir Thomas More. About the year 1485 he went with the embassy of Selling to Italy, where he became associated with the most accomplished Greek scholars of the age. Two years later we find him at Padua, studying medicine, in which subject he obtained his doctorate with distinction. Shortly afterwards he returned to this country, where the Universities of Oxford and Cambridge, with that liberality which characterized the mediaeval communities of learning, readily conferred upon him their doctorates of medicine in virtue of his degree from Padua. He settled again in Oxford, and during that period Erasmus, attracted by his fame as a humanist, came to him in order to learn Greek.

At the turn of the century, however, a decisive change took place in Linacre's life; he was appointed tutor to Arthur, Prince of Wales, and left the university for the Court. In those days medicine was not the separate speciality that it is to-day, and it was customary for its more distinguished practitioners to combine it with theology and general learning. It was therefore not unusual that Linacre became, not only tutor, but physician to the young Prince, nor surprising that before long we find him the leading physician of his time.

In this position it was inevitable that he should be involved in the efforts that were being made to reform the organization of medicine in this country, efforts which culminated in the foundation, by King Henry VIII, of the Royal College of Physicians of London.

Throughout this period, however, Linacre, despite his concern with practical affairs, succeeded in reserving a portion of his time for the pursuit of learning. For him this took a scholarly form. It was his purpose to produce accurate translations, into Latin, of Greek authors whose works had hitherto only been available, if at all, in garbled and incomplete versions reached through the medium of Arabic; and, indeed, it is in the field of grammar that we find the only original work to which Linacre can lay claim.

In 1509 Linacre was ordained; but this implied no important change in his way of life, for in those days it was an accepted, and indeed favoured, custom for the priesthood to combine medical and spiritual ministrations. It did, however, allow him to receive a plurality of benefices in accordance with the custom of the day.

Linacre's life was now drawing to its close. Gradually he withdrew from active practice and devoted more and more of his time to scholarship. Six years after the foundation of the College of Physicians he died; but it is in keeping with his life that his will should bear evidence of his concern for the promotion of learning. In that will he provided for the endowment of lectureships at Oxford and at Cambridge in which the lecturer was to expound certain named classical medical texts. It is one of those lectureships that I have the honour to hold this afternoon.

Such, in brief, was Linacre's life; and those of us whose own lives have led us into teaching, research,

*The Linacre Lecture, delivered at St. John's College, Cambridge, on May 6, 1955.

the practice of medicine, and the development of administration must, as we read of it, be conscious of a sympathetic gleam of recognition as we see how clearly the pattern repeats itself even to-day. But what does it all amount to? Was he merely a successful man within the context of his time; or had he a greater claim to consideration?

### His Fame

In his lifetime Linacre achieved fame as a physician, a grammarian, a medical scholar, and an administrator. Did he, in any of these, show a vision and understanding such as would justify a title to greatness?; or was he only carried by the tide of his time, and is his fame merely eponymous?

Linacre was a successful practising physician. But equally so were many of his contemporaries and successors whose names have now faded from memory.

He has been hailed as one of the founders of English humanism, but this was certainly not his aim. His object in acquiring an accurate knowledge of Greek was to reach truths that he was convinced were of vital importance to mankind and which, he believed, lay hidden in the original texts. His object in teaching Greek was to enable others to do likewise. To the essentially serious mind of his age, any other reason for his labours would have savoured of frivolity or even impiety, and it is doubtful whether he would ever have appreciated, let alone approved, the elegant concept which humanism implies to modern ears.

To the advancement of medical knowledge Linacre made no original contribution. His activities in this field were confined to translating Galen. Yet within a few years of his death Paracelsus was to preface his medical lectures in Basle by publicly burning these works, in evidence of his belief that their teaching was an impediment to progress.

It is evident that on none of these counts can we explain Linacre's title to consideration. There remains his contribution to the organization of medicine.

### His Medical Background

To appreciate the extent of the changes which were brought about in the early part of the sixteenth century it is necessary first to glance at the state of medicine in this country before the new design took shape.

At that time, even in relation to existing knowledge, only a small proportion of those practising physic could be said to be instructed. These were the graduates of the universities, and, as in the case of Linacre himself, most were also ecclesiastics. The general practice of medicine lay in the hands of barber surgeons and apothecaries, and of self-styled practitioners over whose ignorant pretensions there was little control. But the situation was not entirely unregulated. The formal licence to practise both physic and surgery was by long tradition vested in the Church, and this provision probably represented the best that had hitherto been possible. Throughout the Middle Ages the Church had been the main repository of learning, and care of the indigent sick had been its noble duty. To what other institution could mediaeval society have better entrusted the preservation of medical knowledge and the criteria of medical competence?

By Linacre's time, however, the shortcomings of the existing arrangements were apparent to many thinking men. Knowledge was expanding. In Italy a new spirit of inquiry was abroad, and, although this had not, at least in medicine, ventured into originality, it was unearthing old learning with accuracy and in profusion. Small as was the actual accretion to knowledge, when compared with that of the next two centuries, it was still too much to be accommodated within the traditional professional structure of medicine; and the men of Linacre's generation were faced with an administrative problem containing all the classical components—an inadequacy, an abuse, and an established interest. Let us see what happened.

### The New Design

In 1511 a new Act was promulgated. It was laid down that no person should practise physic or surgery within the City of London, or for a distance of seven miles around, unless he had first been examined, approved, and licensed either by the Bishop of London or by the Dean of St. Paul's, acting—and here is the important change—with the advice of four doctors of physic or four expert surgeons. Seven years later the College of Physicians of London was incorporated and empowered, independent of the hierarchy, to forbid from the practice of physic in London and within a precinct of seven miles around the city, any individual, graduates of Oxford and Cambridge excepted, who was not licensed by the President and the College. Four years later these provisions were extended to the whole country.

Now it will be evident to any who have ever engaged in promoting changes in social organization that these developments could never have occurred with such unerring speed unless some individual of outstanding ability had made them his concern. What claim has Linacre to be considered that person?

In his youth Linacre had visited Italy, and, whilst there, had become familiar with associations of learned men, unfettered by ecclesiastical control, devoting themselves to the advancement of their subjects. In the year 1501 Linacre was summoned to the English Court. Throughout his whole life he had been intimate with Colet, Dean of St. Paul's; and Cuthbert Tunstall, Bishop of London, was sufficiently close to him to act as an executor of his will. It seems in the highest degree improbable that high dignitaries of the Church would have consented, save on the persuasion of a close and trusted friend, to the limitation of ecclesiastical privilege involved by the new provisions for licensing to the practice of medicine.

Linacre was physician to King Henry VIII. Perhaps more important was his relationship to the then all-powerful Thomas Wolsey, Cardinal of St. Cecilia and Archbishop of York. Linacre himself was, although an absentee, first prebend and then precentor of York; and he dedicated to Wolsey his translation of "Galen on the Use of the Pulse." Then, as now, those who aim at social change must have, or gain, access to the sources of social power. In those days power was personal, and close relationships with those who possessed it would have been indispensable to any man seeking to promote such a revolutionary scheme as a College of Physicians, governing themselves and controlling admission to a profession as vital to society as medicine. It is evident that Linacre, more than any other man of his time, possessed such relationships. Add to this the fact that his fellow physicians elected him the first President of the new College, and I believe one can safely conclude that to him must belong the major credit for the new achievement.

But, large as this achievement is, it does not exceed that which we might expect from a competent administrator alive to the needs and the opportunities of his time. To prefer a title to greatness it must be shown that he built not only for the present but for the future; that he rose beyond expediency to statesmanship. At the root of every enduring human achievement lies an ideal; and it is on the continued realization of this ideal that the life of a human institution depends. It is the measure of administrative greatness so to devise institutions that they not only satisfy the immediate need which called them into being, but are able, within the context of succeeding ages, to express the ideal on which they are founded. The College of Physicians of London has been such an institution.

The immediate need which faced Linacre and his contemporaries was that arising from the unregulated practice of medicine. The prudence of combining for self-protection must have been evident to all genuine physicians. Before their eyes were numerous examples of trade guilds that had repeatedly demonstrated their ability to act effectively for

their own ends. The question we must ask is, what prevented Linacre's College from becoming simply an organization for the protection of professional interests? What was it that ensured that, through the centuries, his College remained a living and operative force in medicine and did not degenerate either into a picturesque formality or a mere sectional instrument? It was, I believe, that the promoters of this College realized that its survival as an effective influence depended in the last analysis, not merely on the technical competence of its members, not only on their high standard of professional ethics, but also on the intellectual distinction of its fellowship. In the quaint words of its charter, the requirements from its members are, in this order: that they shall be "profound, sad and discrete, groundedly learned, and deeply studied in physic."

It is here, I think, that we see the gleam of an enlightened imagination; and it is not improbable to attribute this to Linacre or to see whence he derived his enlightenment.

At the most formative period of his life Linacre had studied in the centres of Italian learning where the new thought was breaking into light. There he had seen associations of scholars devoting themselves to the advancement of knowledge, not in the narrow and specialized sense of the old mediaeval schools, but with a wide-ranging interest which took all knowledge for the province, if not of the individual, at least of the fraternity. Coming from a country which had scarcely begun to emerge from the restrictive discipline of the old schools, he cannot have failed to have been impressed by the surge of intellectual power arising from this new catholicity of interest, a power which drew its illumination from every relevant source. There he must have felt, even if he did not clearly comprehend, that in the new age now dawning authority was not enough; that for an institution to maintain leadership in any profession it must achieve and preserve intellectual pre-eminence; and that to do this it must ensure broad learning in its fellows and be comprehensive in its fellowship. Is it too much to suggest that when Linacre came to devise the organization of his own profession he should have sought to incorporate within it those features that were giving life and power to the institutions whose inspiration he had witnessed?

How was this realized?

### To be "Groundedly Learned"

Of the three attributes required from the members of the new College, two—that requiring professional competence and that enjoying conformity with professional standards of conduct—were self-evident requirements in any association of skilled men. Every trade guild laid down similar conditions. But among professional associations the third was new. The fellows of Linacre's College were to be not only of good professional conduct, not only deeply studied in physic, but also groundedly learned. Precisely what was in mind? This is revealed by the terms of the Linacre lectureships and confirmed by the dispute which took place between his College and the University of Oxford some years after his death. The lectureships provide not for general cultural studies, as one might have expected in the foundations of such a humanist, but for the exposition of those medical texts which, to Linacre, were the basis of professional knowledge. We should find their counterpart to-day in the study of the natural sciences related to medicine. The dispute with Oxford showed that the importance of the founder's concern for basic learning had been fully appreciated. Its outcome was that the College, with the help of Cardinal Pole, was able to insist on that university adopting statutes which provided that candidates should first graduate in arts, but—and this is the significant point—that their studies in arts should be, not undirected, but in subjects relevant to their future profession. They should be "groundedly learned."

This was the essential decision which ensured that the standards of Linacre's College were to be those of the academy, not of the commercial guild.

But it would have been impossible for Linacre, or any of his contemporaries, to have foreseen the importance which circumstances would give to this decision. More than three centuries were to pass before, with the foundation of the University of London, the English universities became an effective influence in medicine. Throughout the whole of this period the intellectual standards of medicine were in the custody of Linacre's College and similar bodies which had taken it as their prototype. On their understanding and encouragement the development of medical knowledge depended. Had they interpreted their responsibilities in any narrow professional sense, the course of medicine in this country would have been very different and they themselves would long ago have become inconsiderable. As it was, by including within their fellowship the widest representation of medical knowledge they preserved themselves from a sterile and narrow professionalism and the body of English medicine from disintegration.

The first fruits of this enlightened policy were not long in appearing. One has only to look at the role of the Royal College of Physicians for the first hundred and fifty years of its existence to see that this body comprehended the scientific intellectual power of this country. Not only those who concentrated on the clinical aspect of medicine, like the great Sydenham, but others who extended the foundations of physic—Harvey into physiology; Wotton and Collins in natural history; Glisson, Wharton, and Willis in anatomy; Gilbert in experimental physics; and many in even further fields—were all members of the same fellowship. In such a fraternity the future became possible; in such a fraternity all could repose trust.

### A Recurrent Situation

I have dealt at some length with Linacre and his work because I believe that the situation which faced him is recurrent in the life of learned professions.

Professions arise in response to the recognition of a social need, and their continued existence is dependent on their success in satisfying the expectations raised by the state of the knowledge which they profess. In periods when progress is slow or confined to the consolidation of previous advances, the professional organization which provides for its integration, and focuses its social application, is under no strain and its adequacy is questioned neither by its members nor by society. But from time to time, under the influence of a new outlook, great surges of activity sweep the field. New knowledge accrues at a rate and in a variety which threatens to exceed the capacity of traditional organizations, and new intellectual relationships are revealed which cut across the accepted divisions of professional activity. That was the situation which faced Linacre and his contemporaries. To meet immediate needs reorganization of the professional structure was essential; to realize the promise of the future the unity of the professions had to be ensured and the integration of professional knowledge maintained. It was the measure of the greatness of Linacre and his contemporaries that both problems were solved: the former by creating a type of professional institution which made the new knowledge available to society; the latter by promoting a concept of professional learning which prevented disintegration into narrow and exclusive specialties.

A similar situation faces us to-day. Over the last hundred years the application of the philosophy of science to medical and biological phenomena has unleashed powers which could no longer be deployed within the old organization of medical services and has led to the accumulation of new knowledge in such profusion and variety as to threaten the intellectual unity of medicine. In this country we have attempted to meet the organizational problem by creating a National Health Service; but, as yet, our attempts to deal with the intellectual problem and its implications are no more than tentative. It is to this latter that I would especially draw your attention, for it is on our success in

solving this that the continued progress of medical knowledge and the state of medicine in this country ultimately depends.

If one asks a variety of medical men what, in their opinion, are the disturbing tendencies in medicine to-day, one will receive a variety of answers, but, in general, they will all reflect an awareness of the same underlying tendency. One will complain of the impossibility of keeping abreast of the flood of new medical knowledge. Another will deprecate the tendency to narrow specialization. A third will complain of the increasing divorce between practice and research. Yet another will deplore the invasion of medicine by non-medical experts from the natural sciences; a fifth the shrinking number of medically qualified men in the preclinical fields. These apprehensions are all manifestations of the same need—the need to find a concept which will enable us to organize the different branches of medical knowledge so as to preserve the intellectual unity of the whole.

### A Natural Phenomenon

The present situation has arisen because medical knowledge has grown to such an extent that it is no longer, and never again will be, within the capacity of any individual man to master more than a small fraction of it. Specialization has become a necessity. To decry this is not only to ignore facts; it is to deny the very means that have made our recent progress possible. Specialization is a natural phenomenon. It is comparable in human affairs to differentiation of function in biology. We are all aware how, in the course of evolution, the organization of living matter developed from the unicellular to the multicellular stage, how this made differentiation of function between individual cells possible, and how these related developments led to an immeasurable increase in the power of living organisms to deal with their environment. But we are also aware that the differentiated cells of the higher organisms depend, not only for proper fulfilment of their function but for very survival, upon their being integrated into one complete organization. It is the same with human organizations. Specialization holds out to them—be they intellectual or social—the promise of vast extensions in power; but it does so only on condition that integration keeps pace with specialization. As Roger Bacon wrote seven hundred years ago: "All sciences are connected; they lend each other material aid as parts of one great whole. . . . As an eye torn out or a foot cut off, so it is with the different departments of knowledge; none can attain its proper result separately, since all are part of one and the same complete wisdom."

If, therefore, we are to see our way out of our present difficulties we must recognize clearly that the problem arises, not from specialization, but from failure of integration. It is in the organization of knowledge that the weakness in the present structure of medicine lies.

In its essence integration is an intellectual process, and, as such, can occur only within individuals. To a greater or less extent, however, all individuals are affected by the environment in which they find themselves. This is particularly true of creative workers, and, for the majority, the climate of opinion in their surroundings—be this provided by the institutions in which they work, the special activity in which they engage, or the professional or academic organizations with which they are associated—largely determines not only their endeavours but the very possibilities that they can entertain. In the intellectual field, neither the individual nor the environment can be considered alone. Let us examine this interaction as shown in the natural history of a specialization.

### The Process of Specialization

Special subjects arise from the general body of medical knowledge when this has reached such a stage that the intensive exploitation of some particular aspect appears possible. The founders of specialties are necessarily men deeply grounded in their science, and it is both natural and possible for them to draw on their general experience for aid in the advancement of their particular interest. At this early stage all circumstances are propitious. Virgin soil lies on every hand open to cultivation; communication with the general body of knowledge is unrestricted. The successors of these pioneers are, however, not so well placed. Inevitably they will have become more specialized and their links with medical thought as a whole correspondingly less sure. By the third generation these links are becoming tenuous, and by the fourth, the specialty may have become so isolated, intellectually, that its members are, in general, unaware of their plight.

Simultaneously with these developments a parallel series of events will have been in progress. The soil susceptible to exploitation by those ideas and methods which had been initially so successful will have shrunk significantly. Preoccupation with acquiring the mass of special knowledge that has been gained will increasingly reduce the chances of new methods and new ideas, which might revitalize the subject, being brought in from elsewhere. A tradition, or even a special organization, will have arisen, and this, by inculcating into its members time-honoured techniques and ideas, may perpetuate rather than relieve their isolation.

All this may happen to any special subject, clinical or preclinical; and, if effective steps are not taken, the outcome is not difficult to foresee. Either the subject will lapse into sterility, content merely with the formal elaboration of its previous achievements; or its field will come to be apportioned among newer specialties that embody the ideas and techniques which its members failed to appreciate. In either case a setback to the progress of learning will occur, for new specialties are seldom discriminating in respect of old knowledge, and years may pass before that which has been displaced is salvaged and brought back to the service of medicine.

I am far from suggesting that the sequence I have outlined is, as yet, applicable in its entirety to any of the existing branches or specialties of medicine. But, to a greater or a less extent, the weakness leading to this sequence is inherent in all, and unless it is clearly analysed, and effective and far-sighted counter-measures are devised, it will inevitably jeopardize not only their own progress but the unity of medicine itself. The essential threat is intellectual isolation. The remedy, in principle, is clear: to maintain, or in some cases reopen, adequate communications with the general body of medical knowledge. This, however, discloses formidable difficulties.

The commonly accepted meaning of specialization is that of a contraction of interest within a particular branch of medicine. But, as I have said on several previous occasions, there is, in my opinion, a more serious danger in the accepted organization of medical knowledge itself. It is the legacy of an earlier specialization and one that I have ventured to call "stratification." As medicine has developed, knowledge has tended to accumulate in successive layers which correspond roughly to the sequence of studies in the medical curriculum. Within each layer communications and comprehension are relatively good; but between successive layers they may be disquietingly poor. Particularly is this so between the group of studies which are called preclinical and those classified as clinical. Thus the physiologist, although usually well acquainted with the work of other professed physiologists and not insusceptible to that of biochemists and biophysicists, is only too often completely unaware of work and thought in pathology or clinical medicine that is of the utmost concern to his own interests. Equally, the clinician may be quite ignorant of work in other branches and specialties of medicine that is essential to his understanding of the problems with which he is engaged. Integration is required, therefore, not only laterally between those who have specialized within the established branches of medicine, but in depth between the branches themselves. What steps have been taken to deal with this situation?

### Integration of Knowledge

It is now widely recognized that the advancement of knowledge in many fields of medicine requires the bringing to bear of several different disciplines. This has led to the formation of teams of investigators comprising experts in several subjects; and, unquestionably, such teams have not infrequently been successful. But they have fallen short of expectation sufficiently often to raise doubts whether this device, in itself, is an answer to the problem; whether the success which has attended it on occasion may not have another explanation. To be effective a research team must be an intellectually integrated unit. There is, however, a limit to the distance over which men of different disciplines can communicate, and a loose confederation of highly specialized experts cannot reasonably be expected to achieve unity of purpose. It is not, therefore, surprising to find that those teams that are successful comprise men—and above all possess a leader—who, while expert in a particular field, are sufficiently skilled in the other disciplines concerned to talk the language and appreciate the outlook of those other experts whose help is required. This is the essential factor making for the success or failure of teamwork; the presence in the team of men whose knowledge is broadly grounded; and it is only in so far as a research team contains such men that it can be an answer to the dangers of specialization.

Recently we have witnessed a particular example of this principle which involved a whole branch of medicine and is now rapidly reaching fruition. Twenty-five years ago the progress of knowledge in human anatomy had come almost to a standstill. Its original task of describing the gross structure of the body had been brought practically to completion, and it seemed, almost, that it was kept in being as a separate study only by the necessities of teaching. Then it rediscovered its purpose—the elucidation of the functional significance of structure—and it imported from its sister subjects the approach and techniques to give this effect. At first it had to acquire specialized personnel, but now it has assimilated these skills into its own discipline, and its personnel, thus equipped, have reintegrated their subject into the development of medicine.

These considerations have brought us back to the crux of the matter. Integration of knowledge occurs within a man, not between men. If medicine is to maintain its unity then it must include among its members, not only the whole range of specialists in its component subjects, but men who, within their own persons, link relevant disciplines. But there are limits to human capability, and one must frankly recognize that we cannot expect such men to be as comprehensive in their knowledge of the several contiguous subjects they integrate as those whose sole concern is with any one. We must be prepared to allow them to contract their interests in that branch of medicine or specialty with which they are primarily concerned in order that they may develop the necessary competence in others. We must, in fact, make provision for further groupings of intellectual relationships.

How are we to do this, and how are we to accommodate such men when produced within the structure of our profession?

### The Task for Universities

Medical men and biologists receive their initial training in the universities. With the passage of time, however, the training structure at the undergraduate and immediate postgraduate levels tends to become formalized; although this may be satisfactory for producing competence in well-established subjects, it does not in many cases provide a sufficient foundation for work in newer fields. In general, these are the fields in which two or more disciplines, hitherto regarded as distinct, are coming together. If the universities are to keep pace with advancing knowledge, if they are to equip their graduates for the future, then they must be prepared to allow more elasticity in the planning of courses of study, more discretion to the individual. In this connexion the course in basic medical sciences, now under trial at Harvard, may well repay examination.

But, although much may be done on these lines, the mass of knowledge now necessary for those who aim at entering new fields is such that the need to provide more comprehensive postgraduate study must be faced. In relation to medicine there is one special problem in this respect which is causing concern, not only in this country, but elsewhere. It is the diminishing recruitment of medically qualified men to the non-clinical branches of medicine. I am far from unaware of the many distinguished contributions to medical knowledge that have been made by men without such qualifications; but, when one remembers how fruitfully in the past those studying the normal have drawn upon the knowledge of the abnormal, the prospect that at some future date the preclinical sciences might be devoid of those with such supporting experience understandably causes disquiet. But the ordinary medical course of to-day is so long and so detailed as to deter many who intend to spend their lives in the preclinical field from attempting it. The possibility might well be considered, however, of providing for these an alternative more restricted course which, while not entitling to practise, would open to them those studies in the abnormal which are the counterpart of their own interests.

It is, however, in the clinical field that the problem of ensuring the integration of medical knowledge is most pressing.

### The Task for Hospitals

Clinical research, in the strict sense of the investigation of illness in human patients, must necessarily be carried out by men who are themselves competent clinicians. To-day, however, such research may need, in addition to the clinical skills, the ideas and techniques of any of the branches of knowledge related to medicine. Experience during the last fifty years has indicated that those who seek to advance clinical knowledge must usually be, not only fully competent in some branch of clinical medicine, but also expert in the basic subject, or subjects, most relevant to their clinical interest. That is largely true now. It will be even more so in the future.

But let us be quite clear about the level at which we must aim. Clinical knowledge is not going to be advanced by men with a smattering of either clinical medicine or basic science. It is men of authority who are required—authority, not only as clinical consultants, but also in the basic medical science with which they are concerned; men whose opinions command the respect of both their clinical and their preclinical colleagues. Given a few such men in any specialty, its fruitful integration with the general body of medical knowledge would be largely assured. Devise training requirements which will permit the emergence of such men according to the changing needs of developing knowledge, and provide, as a matter of principle, full careers for them within the medical institutions of this country, and a major threat to the progress of medicine will have been removed. There is no shortage of potential recruits, and the difficulties in the way of its realization are largely of our own devising.

At this present time there seems to be a tendency to cast the training requirements for consultants and specialists into such rigid moulds as to discourage the production of any save existing types. In many cases the prescribed experience is so comprehensive and exacting as to leave little or no time for a man to develop any original talents that he may possess. Similarly, there seems to be a far greater reluctance than there was in the past to create consultant or specialist posts for those whose skills do not conform to some established pattern. These tendencies are understandable. The responsibilities of medical practice impose upon us the duty to ensure that those who have charge of patients are competent within their special field. But it is largely within our own hands to define the extent of this field in any particular case. Indeed, in recognizing and creating opportunities for the practice of the existing clinical specialties,

our predecessors have already done this. The future requires that we, in our time, show an equal sensitivity to the needs of medical progress and, by avoiding the imposition upon medicine of a rigidity of training and an inelastic career structure, remain free to take advantage of opportunities and to meet needs as they arise.

These dangers are most evident in those clinical specialties whose practice, as defined at present, requires a high degree of manual skill. Over the last seventy years, antisepsis, asepsis, and anaesthesia have enabled such specialties to conquer a considerable number of their problems. But it is evident that the many which remain, and pose the present challenge, are unlikely to be susceptible to the same approach. Yet in such specialties the systems of training and requirements for staff appointments are predominantly determined by previous achievements, and these militate against the recruitment of those who, by bringing other skills to bear, could help to solve the problems which prevent progress. The incorporation within the specialty of a few men who were allowed to limit the field of their clinical responsibility so that they might acquire the requisite skill in those ideas and techniques of which the subject stands in such need, might go far to solve the present dilemma.

These are no new prescriptions. They are the modern version of the principle on which Linacre founded his College; that our profession should contain men who are not only deeply studied in physic but groundedly learned. Before the first world war these requirements were accepted as in the highest tradition of British medicine, and among the chief ornaments of our profession at that time were clinicians who were also outstanding as pathologists or physiologists or chemists. In recent years, however, overwhelmed with the flood of new knowledge, we have seemed to lose sight of this principle. To our failure in this respect we can primarily attribute the present increasing separation of practice from research, the widening division between the components of medical knowledge and the disappointing progress of many specialties. The most urgent task before medicine to-day is to redress our omission while this is still possible.

There remains one final consideration.

### The Essential Endeavour

In the advancement of knowledge, associations of men bringing together a wide variety of talents and experience have played a major part. Here men make contact with other interests and are exposed to a wider perspective which enables them to appreciate the relationships of their own specialized preoccupations to the general body of learning. Here they see excellence and are prompted to emulation. But, above all, it is in such associations that men become conscious of a continuing and underlying community of interest which strengthens each against intellectual isolation and preserves the body of their learning from dissolution. That is the principle underlying the concept of a university. That was the principle underlying Linacre's great design. But to-day, with the increasing extension of the field of medicine and the differentiation which has been allowed to creep into its professional structure, it is a principle that is becoming increasingly difficult to realize.

Yet if medicine is not to disintegrate into a series of isolated specialties and its organization into a collection of bodies representing simply sectional concerns, then its traditional institutions must ensure, as they have done in the past, that they remain the focus of its manifold interests. This they can do only if they succeed in sustaining a sense of common fellowship among the many varieties of men whose services are now necessary to medicine. The essential endeavour of Thomas Linacre and his contemporaries was directed towards realizing this ideal. It remains for us, their successors, to continue in the context of our own times the endeavour that they began; for it is only by the unremitting efforts of its members that a profession can remain within reach of those ideals on which its continued existence as a living and operative force ultimately depends.

# ACUTE PERFORATED PEPTIC ULCER

## FREQUENCY AND INCIDENCE IN THE WEST OF SCOTLAND

BY

**R. A. JAMIESON, F.R.C.S.Ed.**

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A survey of perforated peptic ulcer in the West of Scotland for the period 1924–43 has already been published (Illingworth, Scott, and Jamieson, 1944; Jamieson, 1947). The present report brings the survey up to date by covering the period 1944–53.

The region surveyed includes the City of Glasgow and the counties of Argyll, Dumbarton, Lanark, and Renfrew. This region is particularly suitable for a survey of the kind, because it carries a community which is large and (as regards emergency surgery) virtually isolated. The population exceeds 2 million, densely congregated towards the centre in Glasgow and the industrial towns of Clydeside. Towards the periphery of the region the population is sparse, and its few cases of perforation are directed towards Glasgow. It follows that the population from which patients are drawn corresponds with the population of the four counties, and can be determined from the decennial census and from the annual estimates of population made by the Registrar-General. Finally, a count of the perforations occurring in this community can be made by searching the hospital records, for the features of perforation are so characteristic and the need for hospital treatment so clamant that few who have perforated can fail to reach hospital.

In comparing present with previous hospital experience account must be taken of the increasing amount of emergency surgery done at the old municipal and local hospitals taken over in 1948 by the State. It is no longer possible to estimate the total perforations in the region from a count of those treated in the large teaching hospitals in Glasgow. Formerly, as we showed in the previous survey, these institutions treated 80% of the perforations in the region, but now the proportion has fallen to 65%. A change of this kind was foreseen, and in the present survey perforations have been counted for each hospital in the region for each year. The total count for 10 years amounts to 6,343 perforations.

The patients counted in the present and previous surveys are limited to those in whom the diagnosis of perforation has been confirmed at laparotomy or necropsy. The standard operative treatment has been by simple closure of the perforation. Gastro-enterostomy has been added 244 times. Primary gastrectomy has been done 26 times.

### Frequency and Incidence of Perforation in the Population

The number of perforations treated annually in the region is shown in Fig. 1. It will be seen that over the 30-year period perforation has become increasingly common. The general trend is an almost linear increase from some 200 perforations in 1924 to some 700 in 1953. Apart from the violent disturbance of the uniform trend during the war years, which was discussed in the previous report, the year-to-year fluctuations have been small.

These figures provide a basis for calculating the changing incidence of perforation in a population of known size. According to the Registrar-General's estimates the population has remained almost stable at about 2.1 million, and it follows that the curves shown in Fig. 1 represent incidence

rates per 2.1 million. In more convenient units, the incidence of perforation per 100,000 population in sample years was: 11 (1924), 19 (1930), 30 (1940, a war year of high incidence), 31 (1950), and 33 (1953).

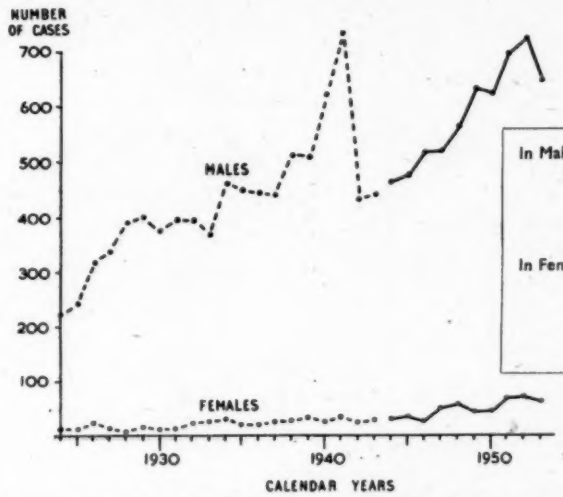
### Sex and Age Distribution

The great preponderance of males remains a feature, but the preponderance is now less than it used to be (Fig. 1). During the period 1924–43 the ratio was 19 males to 1 female, and during 1944–53 it was only 12 to 1. A falling sex ratio was already apparent towards the end of the previous survey, and a gradual fall seems to be continuing.

The general features of the age distribution are shown in Fig. 2. The great majority of the patients fall into the middle-age groups. Elderly patients are not numerous, but they are of special importance because perforation carries a high fatality rate in old age: it will be seen that the group of elderly patients, small though it is, includes among its members one-third of all the patients in the series who died. Women who perforate tend to be older than men, and in the previous survey there was a material difference in mean age (3.0±0.78 years). A difference is again found in the present survey (1.36±0.75 years), but it is smaller than before, and barely reaches the conventional level of significance. It is of interest to note that between the two surveys the mean age at perforation has increased, in women very slightly (from 43.9 to 44.2 years) and in men materially (from 40.9 to 42.9 years). These changes are of the kind expected, for we noted previously that the age of perforation had been rising throughout the period 1924–43.

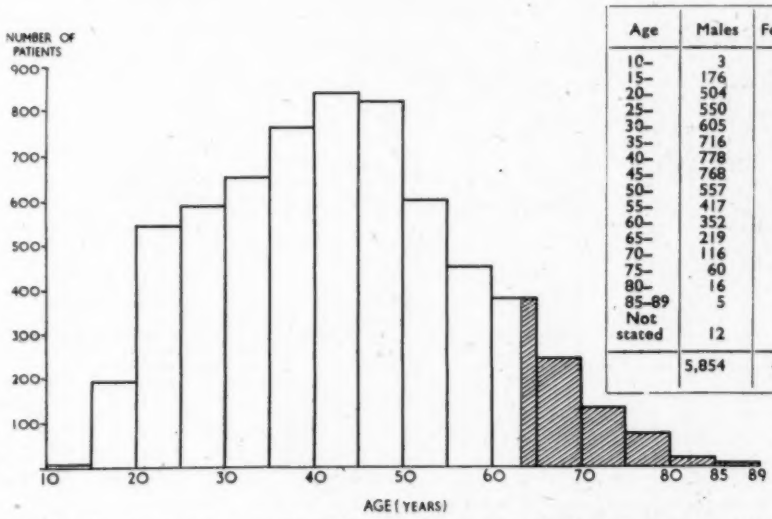
### Incidence of Perforation at Various Ages

The changes in mean age at perforation noted above may appear small, but they have a striking effect on the incidence of perforation calculated on the basis of the population alive at successive ages, for the population dies out rapidly as age advances. The incidence of perforation at various ages, calculated as at the census years 1931 and 1951, is shown in Fig. 3. It will be seen that at every age group the incidence of perforation has risen with the lapse of 20 years. The increases are not uniform. The increase is small at the younger ages, greater in middle age, and more than doubled at ages over 60. Ageing of the population cannot, however, be invoked to explain the changes discussed here, where the incidence rates are calculated on the basis of 100,000



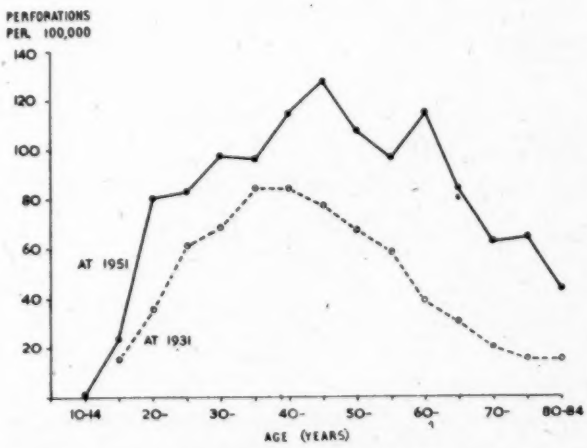

| | | | | | |
|---|---|---|---|---|---|
| In Males: | 226, | 244, | 319, | 339, | 390 |
| | 401, | 375, | 394, | 394, | 368 |
| | 463, | 451, | 446, | 441, | 510 |
| | 508, | 621, | 735, | 431, | 440 |
| | 462, | 475, | 515, | 519, | 562 |
| | 632, | 622, | 699, | 725, | 643 |
| In Females: | 13, | 13, | 24, | 25, | 8 |
| | 18, | 14, | 16, | 26, | 29 |
| | 31, | 21, | 20, | 26, | 29 |
| | 33, | 26, | 34, | 26, | 30 |
| | 31, | 36, | 27, | 51, | 56 |
| | 42, | 45, | 68, | 71, | 62 |

FIG. 1.—Number of perforations in successive years from 1924–53. The numbers given for 1924–43 are estimates based on counts at teaching hospitals (see text), and the numbers for 1944–53 are actual counts at all hospitals. The broken lines represent previous survey, the continuous lines the present survey.



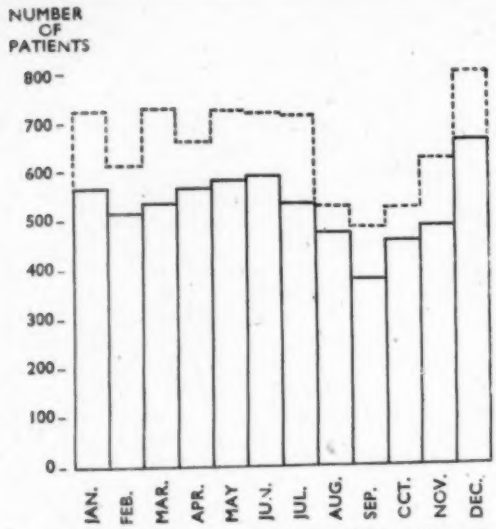

| Age | Males | Females |
|---|---|---|
| 10– | 3 | 3 |
| 15– | 176 | 19 |
| 20– | 504 | 41 |
| 25– | 550 | 41 |
| 30– | 605 | 50 |
| 35– | 716 | 48 |
| 40– | 778 | 64 |
| 45– | 768 | 55 |
| 50– | 557 | 45 |
| 55– | 417 | 34 |
| 60– | 352 | 28 |
| 65– | 219 | 26 |
| 70– | 116 | 17 |
| 75– | 60 | 13 |
| 80– | 16 | 3 |
| 85–89 | 5 | 1 |
| Not stated | 12 | 1 |
| | 5,854 | 489 |

FIG. 2.—Graph showing age distribution for males and females together. Patients over 63 yield one-third of all deaths. For data on deaths see Fig. 8.



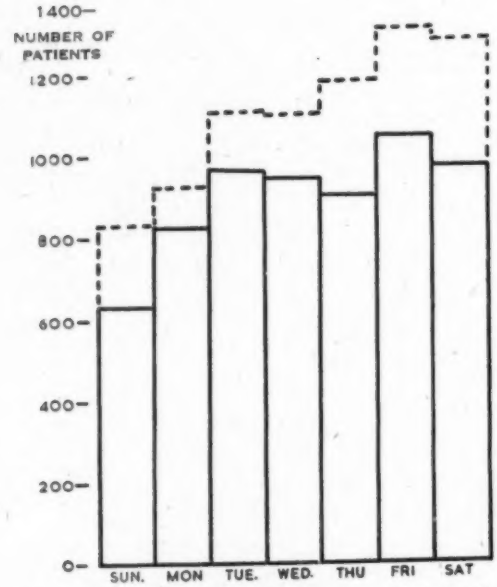

| Age | 1931 | 1951 |
|---|---|---|
| 5– | — | — |
| 10– | — | 1 |
| 15– | 15 | 23 |
| 20– | 35 | 80 |
| 25– | 61 | 83 |
| 30– | 68 | 97 |
| 35– | 84 | 96 |
| 40– | 84 | 114 |
| 45– | 77 | 127 |
| 50– | 67 | 107 |
| 55– | 58 | 96 |
| 60– | 39 | 104 |
| 65– | 30 | 84 |
| 70– | 20 | 62 |
| 75– | 15 | 64 |
| 80– | 15 | 64 |
| 85–89 | — | — |

FIG. 3.—Annual incidence in males per 100,000 males living at each 5-year age group. Based on censuses of 1931 and 1951, and the perforations of 1930, 1931, 1932 and 1950, 1951, 1952.




| | No. of Perforations (Sexes Combined) | |
|---|---|---|
| | 3 Teaching Hospitals 1924–45 | 4 Counties 1944–53 |
| January ... | 725 | 568 |
| February ... | 614 | 517 |
| March ... | 730 | 536 |
| April ... | 662 | 566 |
| May ... | 723 | 582 |
| June ... | 717 | 590 |
| July ... | 711 | 532 |
| August ... | 527 | 472 |
| September | 483 | 379 |
| October ... | 518 | 457 |
| November | 623 | 485 |
| December | 796 | 659 |

FIG. 4.—Incidence by months. The broken line represents previous survey, the continuous line the present survey.




| | No. of Perforations | |
|---|---|---|
| | 3 Hospitals 1924–45 | 4 Counties 1944–53 |
| Sunday ... | 834 | 639 |
| Monday ... | 904 | 829 |
| Tuesday ... | 1,161 | 976 |
| Wednesday | 1,151 | 956 |
| Thursday ... | 1,182 | 906 |
| Friday ... | 1,315 | 1,057 |
| Saturday ... | 1,282 | 980 |

FIG. 5.—Incidence by days of the week. The broken line represents previous survey, the continuous line the present survey.

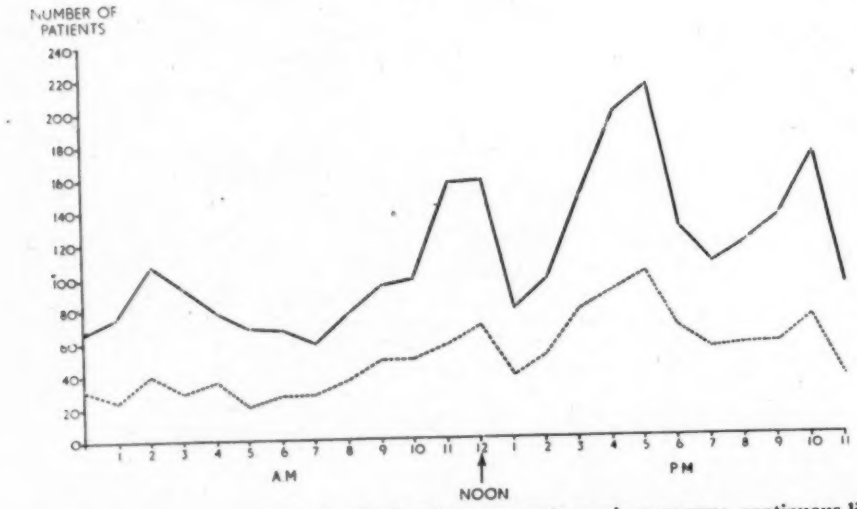



FIG. 6.—Broken line represents previous survey; continuous line, the present survey.

population alive at each age group. The increasing incidence of perforation in the elderly need not be regarded with gloom. It is attractive to speculate that ulcer patients (from whom the victims of perforation are recruited) are surviving into old age in larger numbers now than previously.

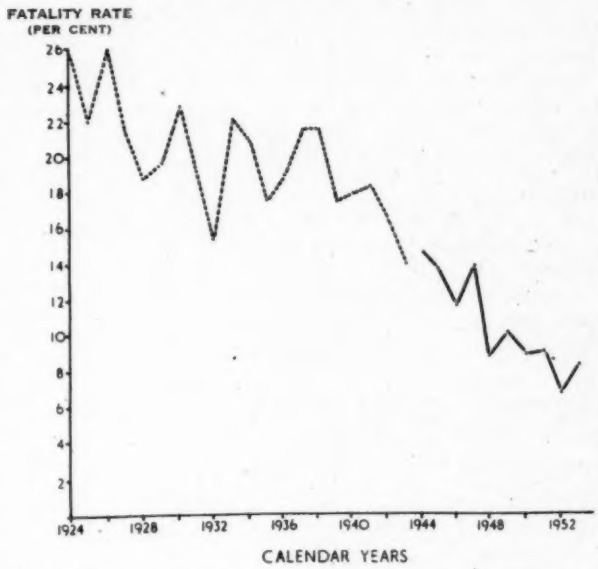
It is of interest to attempt an estimate of the risk of perforation in ulcer patients, and to compare this with the risk of reperforation among those who have already perforated once. At the rates operating in 1951 there was approximately 1 perforation annually per 1,000 adult males (96 male perforations per 100,000 males aged 20 or more). According to the field survey of Doll and Jones (1951), the incidence of ulcer in the adult male population is between 50 and 100 per thousand. Taken in conjunction, these estimates suggest that, among adult males with ulcer, between 1 and 2% perforate annually. This figure can be compared with the risk of reperforation. In a follow-up study of patients who perforated between 1938 and 1943 (Illingworth, Scott, and Jamieson, 1946) the annual risk of reperforation within the first five years varied between 1.4 and 2.4%. It appears that among the survivors of perforation the risk of reperforating is about the same as the risk of perforation in the ulcer population at large. This conclusion is advanced with some diffidence, because it is at variance with general opinion.

### Incidence of Perforation by Months of the Year

Cases occurring in like months over the ten-year period have been added together. Fig. 4 shows the monthly distribution so obtained, and compares it with the distribution over the previous 20 years. The two distribu-

| Hour of Perforation | No. of Perforations | |
|---|---|---|
| | 1 Hospital 1938–45 | 4 Counties 1944–53 |
| Midnight– | 30 | 67 |
| 1 a.m.– | 25 | 73 |
| 2 a.m.– | 40 | 109 |
| 3 a.m.– | 27 | 93 |
| 4 a.m.– | 34 | 78 |
| 5 a.m.– | 20 | 64 |
| 6 a.m.– | 26 | 63 |
| 7 a.m.– | 27 | 58 |
| 8 a.m.– | 36 | 76 |
| 9 a.m.– | 49 | 92 |
| 10 a.m.– | 47 | 98 |
| 11 a.m.– | 57 | 154 |
| Noon– | 68 | 156 |
| 1 p.m.– | 36 | 97 |
| 2 p.m.– | 49 | 116 |
| 3 p.m.– | 75 | 168 |
| 4 p.m.– | 88 | 219 |
| 5 p.m.– | 99 | 231 |
| 6 p.m.– | 65 | 147 |
| 7 p.m. | 54 | 126 |
| 8 p.m.– | 55 | 138 |
| 9 p.m.– | 56 | 153 |
| 10 p.m.– | 71 | 170 |
| 11 p.m.– | 35 | 110 |
| Not stated | 179 | 1,350 |
| | 1,348 | 4,206 |

tions are very similar. Allowing for the varying length of calendar months, the incidence of perforation is about uniform from January to July. The incidence falls during August, September, and October, and returns to about the spring level in November. December shows an incidence higher than any other month. It need hardly be said that these fluctuations in numbers are much too large to be readily attributed to chance. It is relevant to point out that the holiday month in the West of Scotland is July, and it seems possible that the relative deficiency of perforation in the ensuing three months may perhaps be due to the July period of rest and recreation. The high incidence of perforation in December is not limited to the Christmas period, but is spread over the second half of the month. Many of the artisan class work overtime in the week or two before Christmas in order to earn extra wages to cover the Christmas expenses, and it may be that the high incidence of perforation in December is in part attributable to fatigue rather than to dietary indiscretion.



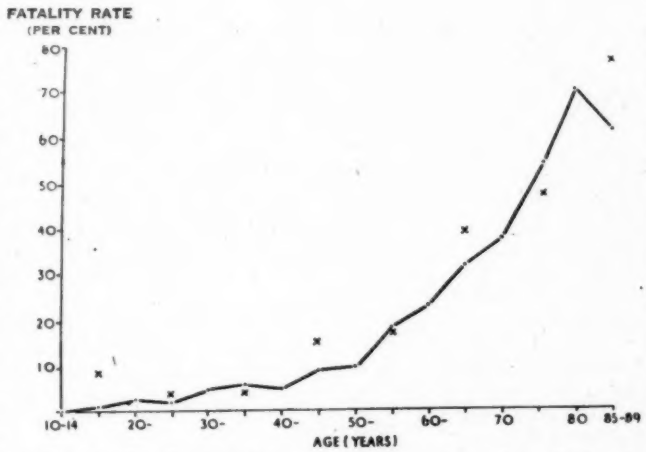

| | No. of Perforations | |
|---|---|---|
| | Total | Died |
| 1924 | 191 | 49 |
| 1925 | 205 | 45 |
| 1926 | 274 | 71 |
| 1927 | 283 | 61 |
| 1928 | 318 | 60 |
| 1929 | 335 | 66 |
| 1930 | 311 | 71 |
| 1931 | 328 | 63 |
| 1932 | 336 | 52 |
| 1933 | 317 | 70 |
| 1934 | 395 | 83 |
| 1935 | 378 | 66 |
| 1936 | 373 | 71 |
| 1937 | 374 | 81 |
| 1938 | 431 | 93 |
| 1939 | 432 | 75 |
| 1940 | 518 | 93 |
| 1941 | 615 | 113 |
| 1942 | 366 | 60 |
| 1943 | 376 | 53 |
| 1944 | 493 | 73 |
| 1945 | 511 | 71 |
| 1946 | 542 | 64 |
| 1947 | 570 | 80 |
| 1948 | 618 | 55 |
| 1949 | 674 | 69 |
| 1950 | 667 | 60 |
| 1951 | 767 | 70 |
| 1952 | 796 | 54 |
| 1953 | 705 | 59 |

FIG. 7.—Fatality rates by calendar years. Data for 1924–43 are for three teaching hospitals and for 1944–53 for all hospitals in four counties. The broken line represents the previous survey, the continuous line the present survey.

### Incidence of Perforation by Days of the Week

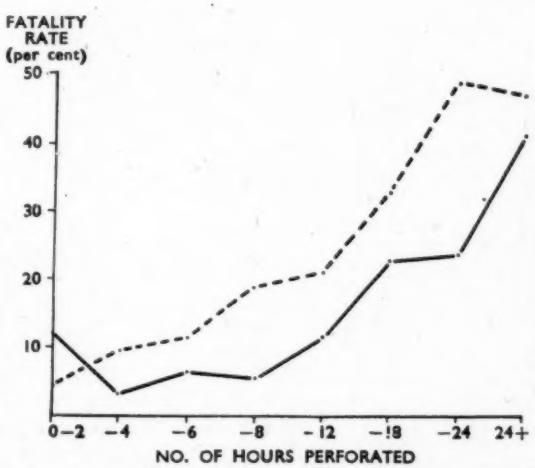
In a similar way, perforations occurring on like days of the week have been added together, and the results are shown in Fig. 5. Again there is close agreement between the distributions obtained in this and the previous surveys. Perforation is least common on Sundays, commoner on Mondays, and commoner still during the remainder of the week, reaching a maximum incidence on Fridays. The departure from uniformity of distribution is large, and the Friday perforations exceed the Sunday perforations in the ratio of about 3:2.

Variation of the frequency of perforation according to days of the week was sought in the first instance because the week-end rest provided an opportunity for testing the thesis that incidence is related to periods of rest and fatigue. It will be seen that the findings are compatible with this thesis.




| Age (Years) | Males | | Females | |
|---|---|---|---|---|
| | Total | Died | Total | Died |
| 10– | 3 | — | 3 | 2 |
| 15– | 176 | 2 | 19 | 2 |
| 20– | 504 | 14 | 41 | 1 |
| 25– | 550 | 11 | 41 | 2 |
| 30– | 605 | 29 | 50 | 2 |
| 35– | 716 | 43 | 48 | 7 |
| 40– | 778 | 38 | 64 | 11 |
| 45– | 768 | 69 | 55 | 7 |
| 50– | 557 | 55 | 45 | 7 |
| 55– | 417 | 76 | 34 | 10 |
| 60– | 352 | 80 | 28 | 11 |
| 65– | 219 | 68 | 26 | 8 |
| 70– | 116 | 43 | 17 | 6 |
| 75– | 60 | 32 | 13 | 3 |
| 80– | 16 | 11 | 3 | — |
| 85–89 | 5 | 3 | 1 | — |
| Not stated | 12 | 2 | 1 | — |
| | 5,854 | 576 | 489 | 79 |

FIG. 8.—Fatality rates by age for males and females. Perforations, 4 counties, 1944–53. Continuous line represents males, the crosses females.




| Interval between Perforation and Operation (Hours) | 1 Hospital 1939–43 | | 4 Counties 1944–53 | |
|---|---|---|---|---|
| | Total Cases | Died | Total Cases | Died |
| 0 –2 | 90 | 4 | 83 | 10 |
| 2½–4 | 261 | 25 | 811 | 26 |
| 4½–6 | 197 | 23 | 904 | 58 |
| 6½–8 | 103 | 19 | 419 | 24 |
| 8½–12 | 76 | 16 | 266 | 31 |
| 12½–18 | 40 | 13 | 140 | 32 |
| 18½–24 | 31 | 15 | 42 | 10 |
| Over 24 | 15 | 7 | 93 | 38 |
| Not stated ... | 126 | 23 | 1,369 | 123 |
| No operation attempted... | — | — | 79 | 79 |
| Total ... | 939 | 145 | 4,206 | 431 |

FIG. 9.—Deaths by delay in operation. The broken line represents the previous survey, the continuous line the present survey.

### Incidence of Perforation by Hours of the Day

Perforation of a peptic ulcer is so sudden and so painful that the moment of perforation can nearly always be determined, though unfortunately it is not always recorded. In a search of 4,206 case records the hour of perforation was obtained in 2,856, and the findings are shown in Fig. 6. It will be seen that perforation is relatively uncommon during the night, increases in frequency to a minor peak at the end of the morning, to a major peak at the end of the afternoon, and again to a minor peak in the late evening. There is a sharp drop in incidence at noon and at 5 p.m., which for most of the population mark the lunch break and the end of the working day respectively.

The variation in the frequency of perforation according to the hours of the day is in harmony with the general thesis that incidence varies with periods of rest and fatigue.

### Relative Incidence of Perforation at Different Sites

The site of a perforation is easily defined as *gastric* or *duodenal* when it lies well proximal to the pylorus or well beyond it. When the perforation is close to the pylorus, the pylorus itself becomes obscured by oedema and it may be impossible to say on which side of it the perforation lies; such ulcers usually prove on subsequent laparotomy to be duodenal, and they are here classed along with the duodenal perforations in a group termed *pyloro-duodenal*. Finally, there is a group termed "site not stated," which includes patients whose detailed case records were not available, and about whom information was obtained from theatre log-books, hospital registers, and the like.

According to these conventions of nomenclature the site of perforation was as shown in Table I.

TABLE I

| | Males | Females | Total |
|---|---|---|---|
| Gastric | 248 | 71 | 319 |
| Pyloro-duodenal | 5,125 | 378 | 5,503 |
| Stomal | 87 | 3 | 90 |
| In a Meckel's diverticulum | 4 | — | 4 |
| Oesophageal | 1 | — | 1 |
| Site not stated | 389 | 37 | 426 |
| | 5,854 | 489 | 6,343 |

It will be seen that pyloro-duodenal perforations far exceeded all other types, and accounted for some 87% of the total. Gastric perforations accounted for only 5% of the total. Of the 90 examples of stomal perforation, 2 followed the Aylett operation, 13 followed gastrectomy, and the remaining 75 were presumed to follow gastro-enterostomy (61 were stated to do so and in 14 no comment was made). The perforations in Meckel's diverticula were verified to lie beside ectopic "gastric" epithelium, and were believed to result from peptic ulceration; all occurred in youths aged 10–19.

The ratio of pyloro-duodenal to gastric perforation is very different in the two sexes. In males the pyloro-duodenal/gastric ratio is 21:1. In females it is 5:1. The accuracy of these ratios should not be much disturbed by leaving out of consideration the composition of the group in whom the site of perforation is not stated; it will be recalled that in this group the detailed case records were not available, and there is no reason to suppose that this was in any way correlated with the site of perforation.

### Deaths from Perforation

The fatality rate from perforation was noted to be falling throughout the period 1924–43, and the fall has continued throughout the period 1944–53. The fatality rates for the 30-year period are shown in Fig. 7. If year-to-year fluctuations are ignored the general trend appears to be linear, without any sudden improvement which might correspond in timing with the introduction of new therapeutic agents such as the sulphonamides, penicillin, or the muscle relaxants. The improvement over the 30-year period is quite remarkable—the fatality rate falls from about 25% to about 8%—and it must be remembered that this improvement has taken place despite an increasing proportion of elderly patients suffering perforation.

There are doubtless many factors which influence the outcome in individual patients. All that is attempted here is to draw attention to a few factors of general importance—namely, the age and sex of the patient, the site of the ulcer, the interval that elapses between perforation and operation, and the season of the year.

### Deaths by Age Groups in Males and Females

The fatality rate in males and females at different ages is shown in Fig. 8. Males have been taken in five-year groups; females, owing to their small number, in 10-year groups.

It will be seen that the fatality rate not only increases with age but increases more and more steeply as age advances. The fatality rate is less than 5% up to about age 35, rises to 10% by age 50, 20% by 60, 40% by 70, and 70% by 80. It will be seen also that fatality rates are about the same in males and females at equivalent ages. These figures, which represent the overall fatality rates for the period 1944–53, differ in two respects from the corresponding fatality rates for the period 1924–43: first, the fatality rates are now much lower for every age group: and second, the fatality rates (at equivalent ages) are now no longer higher in females than in males.

### Deaths According to Site of Ulcer

Chief interest centres on gastric and duodenal perforations, which are discussed below. Perforations at other sites comprised: stomal, 90 cases (12 died); in Meckel's diverticula, 4 cases (1 died); oesophageal, 1 case (died); and site not stated, 425 cases (60 died).

The numbers of deaths from gastric and duodenal perforations in males and females are given in Table II. In both sexes the fatality rate for gastric perforation was much higher than for duodenal, and this was found to be true at all ages.

TABLE II

| | Total Cases | Died | |
|---|---|---|---|
| | | No. | % |
| Gastric (male) | 248 | 66 | 26·6 |
| ,, (female) | 71 | 20 | 28·2 |
| Duodenal (male) | 5,175 | 444 | 8·7 |
| ,, (female) | 378 | 50 | 13·2 |

The fatality rate from gastric perforation was about the same in the two sexes (26.6% in males and 28.2% in females).

The fatality rate from duodenal perforation was materially lower in males (8.7%) than in females (13.2%), but much of the difference is attributable to the older ages at which women perforate. The male fatality rate rises to 10.1% when it is standardized on the age distribution of females, and the remaining difference between the sexes might well be a chance finding.

### Deaths by Delay in Treatment

Information on the interval between perforation and operation was sought in the records of 4,206 patients and was found in 2,837. The relation between delay in operation and outcome is shown in Fig. 9. The sharp rise in fatality with delay in operation accords with the general experience and needs no comment.

It will be seen from Fig. 9 that 79 patients were admitted to hospital moribund, in whom operation was not attempted. This group alone accounts for more than one-sixth of all deaths in the series.

### Deaths by Season of the Year

Fatality rates remain a little higher in the winter months (October–March) than in summer (April–September). The winter rate was 11.3% (363 deaths in 3,221 cases) as against the summer rate of 9.4% (292 deaths in 3,122 cases).

This difference between the winter and summer fatality rates appears small, but it does in fact conceal the pronounced seasonal variation displayed in Fig. 10, where the fatality rates are shown for individual months. It will be seen that there is an abrupt rise in the fatality rate in January from the December level, followed by a gradual fall throughout February, March, and April. This pattern resembles the seasonal changes in deaths certified as due to respiratory diseases (Annual Reports for the Registrar-General for Scotland), and pulmonary complications may well account for the seasonal changes in fatality from perforation.

| | Total Cases | Died |
|---|---|---|
| January ... | 568 | 85 |
| February ... | 517 | 72 |
| March ... | 536 | 63 |
| April ... | 566 | 64 |
| May ... | 582 | 52 |
| June ... | 590 | 54 |
| July ... | 532 | 36 |
| August ... | 472 | 46 |
| September | 379 | 40 |
| October ... | 457 | 37 |
| November | 485 | 50 |
| December | 659 | 56 |

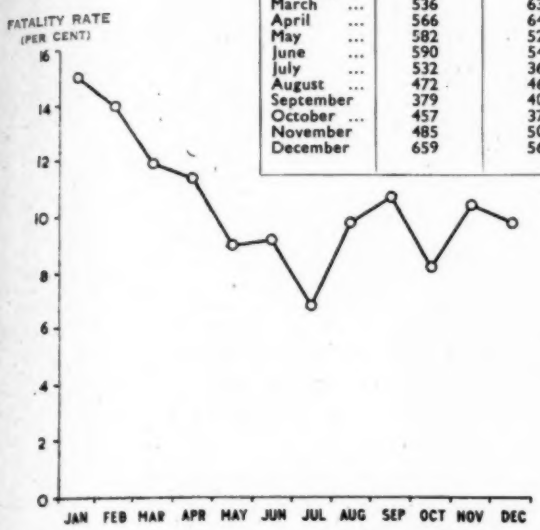



FIG. 10.—Fatality rate by months. Perforations, 4 counties, 1944–53.

### Summary

The incidence of perforated peptic ulcer has been studied in an area of the West of Scotland with a population of over two million. The present report covers the period 1944–53 and brings up to date the previous report for 1924–43. The chief findings are:

1. The incidence of perforation has increased threefold between 1924 and 1953. The increase has been steadily progressive except for an anomalous high incidence during the war years 1941–2.

2. Perforation is much commoner in men than in women, but the sex ratio has fallen from 19:1 formerly to 12:1 latterly.

3. The average age at perforation continues to rise. It remains higher in women than in men, but by a margin which is narrowing.

4. Between the census years 1931 and 1951 the incidence of perforation increased at all ages. The increase was slight in youth, moderate in middle age, and great in old age.

5. Among adult males with peptic ulcer, between 1 and 2% perforate annually. A history of previous perforation does not appear to increase the risk of perforating again.

6. Perforation is relatively uncommon in August, September, and October, and is unduly common in December. These changes may be due to rest at the July holiday season, and to fatigue in December.

7. Perforation is least common on Sundays and becomes progressively commoner throughout the week, reaching a maximum incidence on Fridays. These changes may be due to rest and fatigue.

8. Perforation is relatively uncommon during the night. Its incidence increases to a minor peak at the end of the morning, to a major peak at the end of the afternoon, and again to a minor peak in the late evening. These changes may be due to rest and fatigue.

9. Pyloro-duodenal perforations outnumber gastric perforations in the ratio of 21:1 in men and 5:1 in women.

10. The overall fatality rate from perforation has fallen progressively from 25% in 1924 to 8% in 1953.

11. The fatality rate increases rapidly with advancing age, is much higher in gastric than in pyloro-duodenal perforation, increases with delay in operation, and is seasonally high in January and the early spring.

My thanks are due to the boards of management, superintendents, surgeons, and records officers of the hospitals in the West of Scotland, whose co-operation, freely given, alone made this survey possible; to the Registrar-General for Scotland for providing annual estimates of population; and to Miss S. G. Murray and Mrs. M. Mackenzie for much secretarial help.

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The first Medical Records Exhibition was held in London on May 21, organized by the Association of Medical Records Officers. It illustrated current methods of keeping and storing records and of marshalling patients. At Woolwich Memorial Hospital the whole of a patient's notes are photographed on to a single negative. At University College Hospital, microfilming has been resorted to, radiographs included. Existing storage space can also be made to hold more folders by using mobile stacks of shelving to reduce the circulating area required in the record store, or lateral filing to increase the number of levels of shelving between floor and ceiling. At the Edgware General Hospital the out-patient cards are kept apart from the in-patient notes and destroyed after seven years; the in-patient notes are bound after one year and after 20–25 years destroyed, with the exception of summary sheets, a system that demands a high standard of summary writing. Surveys indicate that no patients return for the same condition after 15 years. Sound-recording facilities exhibited from the Hospital for Sick Children showed that dictation can now be recorded on disk machines in the typing room. Devices such as visible card-trays have been found to ease the task of selection and control of waiting-lists. A public health records exhibit featured a continuous health record kept from the antenatal period until school-leaving age. The Farnborough Hospital exhibit included a nightly ward return which not only served as a basis for bed statistics but contained a forecast of patient movements in the next 24 hours, this being used as a guide in dealing with applications for emergency admission. The value of graphs in the improved use of hospital accommodation was stressed on the King's College Hospital stand. Dr. N. M. Goodman delivered a lecture on "Records and Statistics of Cancer," stressing that systematic follow-up and analysis of records over many years were essential to medical progress.

# LUNG LESIONS IN RHEUMATOID ARTHRITIS

BY

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Pulmonary changes, varying from pleural effusions, pleural thickening, mottling, reticulation, and chronic fibrosis have been observed in patients with "collagen diseases" (Weir, 1939; Elkeles, 1944; Miller and Daley, 1946; Tumulty and Harvey, 1949; Murphy *et al.*, 1941; Weiss *et al.*, 1943; Littler, 1953). A number of authors have noted similar changes in patients with rheumatoid arthritis (Ellman, 1947; Ellman and Ball, 1948; Hart, 1948; Leys and Swift, 1949; Schlesinger, 1949; Bloom and Rubin, 1950; Christie, 1954; Harris, 1954), where no other specific cause for these changes could be uncovered. Ellman and Ball (1948) coined the terms "rheumatoid lung" and "rheumatoid disease" to indicate that these pulmonary changes were another manifestation of connective-tissue involvement similar to that seen in the joints and in nodules of patients with rheumatoid arthritis, "thus indicating the widespread nature of the process in this condition."

More recently Ellman and Cudkowicz (1954) described a group of signs and symptoms in these patients which they labelled the "rheumatoid lung syndrome," characterized by cough, fever, and dyspnoea, frequently associated with an exacerbation of arthralgia. The *x*-ray changes observed were multiform, as described in other collagen diseases. The degree of dyspnoea was often greater than the clinical signs and *x*-ray findings suggested. Fever, leucocytosis, and arthralgia might or might not accompany the onset of pulmonary symptoms. The signs and symptoms were unaffected by antirheumatic or antibiotic therapy and resolved slowly, leaving residual fibrosis and pleural thickening.

Caplan (1953) described, in coal-miners, a syndrome of nodular lung fibrosis which was associated with rheumatoid arthritis in more than 50% of cases; and it was also suggested that the prevalence of rheumatoid arthritis was increased amongst men with complicated pneumoconiosis (Miall *et al.*, 1953). In a further study Miall (1955) has raised again the question of an association between rheumatoid arthritis and tuberculosis. His data suggest that a relationship between the two diseases may exist, and that this relationship is due to some alteration in tissue reaction which is often of genetic origin and perhaps a component of the so-called "rheumatoid diathesis."

In our experience at the Postgraduate Medical School over the last 15 years we have not noticed any specific lung lesions in patients with rheumatoid arthritis, and we have not encountered any instances of the "rheumatoid lung syndrome." We have learnt to recognize lung lesions in allied diseases such as the fibrosis of scleroderma (Shuford *et al.*, 1953) and the interstitial infiltrations of periarteritis nodosa and lupus erythematosus (Rakov and Taylor, 1942). We recognize, but have not personally encountered, the very rare occurrence of rheumatoid nodules in the lung, of the type described by Raven *et al.* (1948). We have also, with Dr. Griffith Pugh, investigated a patient with a lung lesion associated with Sjögren's syndrome, described by Ellman and Weber (1949). Rheumatoid arthritis is a disease that primarily affects the joints—a local disease, affecting some joints and not others, whose economic and human importance depends upon its predilection for synovial membrane. It is a common disease affecting, according to Kellgren *et al.* (1953), approximately 2% in some samples of the population, and many of our patients have had non-specific lung lesions. We have therefore analysed our clinical and pathological experience to determine how often lung lesions occur in patients with rheumatoid arthritis and to see how this compares with the incidence in other hospital material.

## Results

Table I shows that in a consecutively collected series of 253 rheumatoid arthritis patients coming to hospital between 1939 and 1948 and followed to the present time the following clinical diagnoses were made. In 180 there was no evidence of chest disease clinically. In the remainder the most common lesions observed were bronchitis (including pneumonia), bronchitis and emphysema, emphysema alone, bronchiectasis, and old apical tuberculosis. Basal rales were recorded in nine cases, indicative of congestive failure or

TABLE I.—*Clinical Diagnosis Pertaining to Lungs (Rheumatoid Arthritis Follow-up Series, 1939–48) 253 Cases (In a Number of Cases Several Diagnoses were Recorded)*

| | |
|---|---|
| No apparent disease | 180 |
| Bronchitis alone | 26 |
| ,, +asthma | 3 |
| ,, +emphysema | 12 |
| Emphysema alone | 8 |
| Bronchiectasis | 6 |
| Pulmonary tuberculosis—Bilateral | 4 |
| Pulmonary tuberculosis—Unilateral | 3 |
| ,, fibrosis—Honeycombing[1] | 3 |
| ,, fibrosis—Reticulation[2] | 2 |
| Silicosis | 2 |
| Xanthomatosis[3] | 1 |
| Basal rales (congestive) | 9 |
| Carcinoma | 2 |
| Old pleuritis | 2 |
| Pulmonary embolus | 1 |

[1] A. D. (Case 2). H. K. (chronic bronchitis and emphysema). A. W. (infiltration due to chronic lymphatic leukaemia).
[2] D. S. (Case 4). M. C. (rheumatoid arthritis with some features resembling acute lupus erythematosus).
[3] E. P. (Case 3).

TABLE II.—*Radiological Lung Changes During Total Period of Hospital Observation*

| | R.A.F.U. | Controls |
|---|---|---|
| Total cases | 253 | |
| Cases *x*-rayed | 130 | 130 |
| ,, not *x*-rayed | 123 | — |
| No lesions | 68 | 76 |
| Bronchitis[4] | 20 | 10 |
| Emphysema | 13 | 4 |
| Bronchiectasis | 4 | 2 |
| Unilateral apical tuberculosis | 8 | 15 |
| Bilateral ,, ,, | 6 | 7 |
| Pulmonary fibrosis—Reticulation[5] | 2 | — |
| Pulmonary fibrosis—Honeycombing[6] | 4 | — |
| Silicosis | 2 | — |
| Pleural thickening | 8 | 4 |
| ,, effusion | 3 | 4 |
| Pulmonary congestion | 7 | 2 |
| Carcinoma[7] | 2 | 8 |
| Pulmonary embolus | 1 | 0 |
| Spontaneous pneumothorax | 0 | 1 |
| Haemosiderosis | 0 | 1 |

[4] Includes "pneumonitis" (infective, with subsequent clearing).
[5] D. S. (Case 4). M. C. (rheumatoid arthritis, with some features resembling acute lupus erythematosus).
[6] A. D. (Case 2). E. P. (Case 3). H. K. (chronic bronchitis and emphysema). A. W. (infiltration due to lymphatic leukaemia).
[7] Includes metastatic carcinoma to lung.

hypostatic congestive changes. This result does not impress us as very different from what might be expected in a general hospital population.

Examination of the *x*-ray films in 130 cases of this series in which radiological examination of the chest was indicated on clinical grounds revealed a variety of miscellaneous conditions (Table II), but most of them could be accounted for by a current episode of non-specific pulmonary infection, congestive failure, or established underlying disease such as silicosis, old tuberculous infection, or neoplastic disease. Six cases were diagnosed as pulmonary fibrosis, two cases showing reticulation pattern and four showing marked honeycombing. Of the films showing honeycombing, one (A. W.) proved to be lymphatic infiltration in a case of chronic lymphatic leukaemia, and another (H. K.) was due to chronic bronchitis and bronchiectasis with bullous formation and fibrous-tissue reaction. Of the reticulations, one case (M. C.) was due to pulmonary infiltration in a case of possible disseminated lupus erythematosus with rheumatoid arthritis (referred to in the post-mortem series). The three remaining cases presented some difficulty, and are detailed later. In none of these rheumatoid patients with clinical or radiological lesions could we establish any temporal correlation with an exacerbation of their arthritis process.

For comparison with this rheumatoid series of *x*-ray films we chose a similar number of films from consecutive non-rheumatoid arthritis patients sent up for chest *x*-ray examination between April and June, 1954, excluding hospital staff, tuberculosis and antenatal clinic cases, and patients below the age of 20. The spring control period would, if anything, enhance any undue incidence of lung lesions in the rheumatoid arthritis series. However, it will be seen from Table II that the overall incidence of lung disease was slightly greater among the rheumatoid patients than among controls selected in this way. The same sort of changes were, however, seen in both series and in similar proportions.

TABLE III.—*Post-mortem Lung Lesions in* 42 *Cases of Rheumatoid Arthritis*, 1936–54

| | R.A. | Controls |
|---|---|---|
| No lesions | 11 | 23 |
| Bronchitis | 16 | 7 |
| Emphysema | 10 | 9 |
| Bilateral apical lesions | 15 | 4 |
| Unilateral „ „ | 3 | 3 |
| Bilateral adhesions | 18 | 9 |
| Unilateral „ | 9 | 3 |
| Miliary tuberculosis | 1 | 0 |
| Silicosis | 1 | 0 |
| Bronchiectasis | 5 | 0 |
| Terminal bronchopneumonia | 9 | 6 |
| „ carcinoma | 4 | 14 |
| Total cases | 42 | 42 |

Finally, we have examined the lung changes found at necropsy in 42 patients with rheumatoid arthritis dying between 1936 and 1954 in this hospital. Table III shows the lung lesions listed by the pathologist and based on the macroscopic and, where indicated, the microscopical examination of the lungs. (We have excluded 12 cases—8 with ankylosing spondylitis; 3 with rheumatic heart disease, thought to be examples of Jaccoud's syndrome; and 1 case of arthritis with features of both rheumatoid arthritis and disseminated lupus erythematosus in which malignant hypertension and uraemia were also present, and in which there were fibrinous exudates in the lung fields.) Again no specific lung lesion was found and no nodules were seen.

For comparison, we assembled a control series by selecting from the serially numbered post-mortem examinations the next necropsied patient of the same age, decade, and sex as each rheumatoid arthritis patient.

The most frequent lesions observed in both series (Table III) were bronchitis, emphysema, apical lesions, pleural adhesions, and bronchiectasis. Again, there seems to be a higher incidence of all lung lesions, with the exception of emphysema and carcinoma, in the rheumatoid arthritis series than in the non-rheumatoid arthritis group. The frequency, however, with which these main lesions appear relative to each other seems to be the same in both series, with the possible exception of bronchiectasis.

We conclude that there is no specific lung lesion common enough to appear in 42 consecutive post-mortem cases of rheumatoid arthritis—a finding similar to that of Baggenstoss and Rosenberg (1943) from a survey of 30 such cases. The apparently increased incidence of bronchitis, bronchiectasis, and old apical tuberculous lesions in the rheumatoid patient is quite striking, and may be due to a real increased susceptibility of these patients to pulmonary infections, as suggested by Hollander (1953). Alternatively, this apparently higher incidence in the rheumatoid arthritis series than in our control material may be because people with two diseases are sent to hospital more frequently than people with one, particularly if one of the diseases makes them very difficult to nurse adequately under home conditions. Finally, it must be borne in mind that all data based on hospital patients may be invalidated, as Mainland (1953) has pointed out, not only by the conditions of selection of controls but also by the unconscious selection which operates every time any patient is sent to a particular hospital.

## Case Histories Illustrating Diagnostic Difficulties

The following case histories indicate the greatest difficulties we have encountered in arriving at a satisfactory diagnosis of the pulmonary changes. (Cases 2, 3, and 4 were in the follow-up series 1939–48.)

### Case 1

J. M., a male packer, was quite well until 1941, when (aged 41) he developed rheumatoid arthritis involving the hands, feet, and shoulders. His arthritis was never severe and was easily controlled with aspirin and codeine. In 1950 a typical rheumatoid nodule appeared on the posterior aspect of the left ulna. In 1951 pulmonary symptoms first showed when he was admitted to hospital for an acute episode of fever, cough, and pleuritic pain. Left pleural effusion and pericardial effusion were diagnosed. E.S.R. on admission was 101 mm. an hour (Westergren) and fell to 34 mm. on discharge two months later. Investigations for

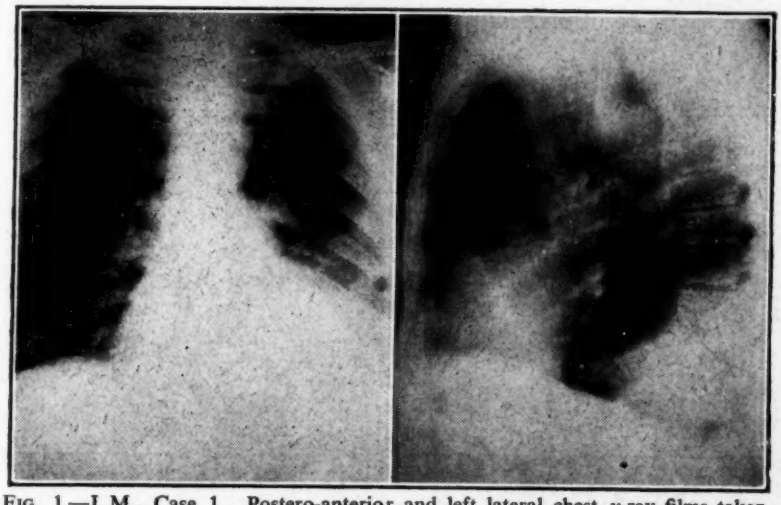

FIG. 1.—J. M., Case 1. Postero-anterior and left lateral chest *x*-ray films taken in March, 1954, showing what was then believed to be pleural thickening but which subsequent investigation indicated to be a collapsed lower lobe due to bronchial carcinoma.

tuberculosis and carcinoma were negative. There was no associated exacerbation of his arthritis at this time. He was discharged relatively symptom-free with *x*-ray signs thought to be due to residual pleural thickening at the left base.

He had a slight cough, which increased in severity and then became productive of mucopurulent sputum: four to six months after discharge he developed persistent streaky haemoptyses and increasing dyspnoea on exertion. In December, 1953, he was reinvestigated, but again no cause was found for the *x*-ray appearances and haemoptyses. In May, 1954, haemoptysis and dyspnoea became progressively severe. At this time he had a mild exacerbation of his arthritis. In September, 1954, he was readmitted to hospital because of haemoptysis, chest pain on coughing, and weight loss.

A chest *x*-ray film (identical with that taken in March, 1954, see Fig. 1) showed what was then believed to be left pleural thickening with fine reticulation in both lung fields, which had progressed slightly since 1951. Other investigations: E.S.R., 55 mm.; differential agglutination titre (D.A.T.), 1:64. A biopsied nodule (right ulna) showed characteristic changes of rheumatoid arthritis. Studies for L.E. cells were negative, as were repeated cultures for tubercle bacilli. Mantoux positive 1:1,000. A bronchogram revealed slight dilatation of bronchi and some compression of left posterior segment of the bronchus to the left lower lobe. Bronchoscopy finally revealed a squamous-cell carcinoma in the left lower lobe bronchus, which was confirmed by biopsy. Re-examination of the chest film at this time indicated that what had been considered to be pleural thickening was probably collapse of the left lower lobe due to bronchial neoplasm.

### Case 2

A. D. first developed rheumatoid arthritis in 1941 at the age of 44, involving ankles, knees, arms, and wrists. He had been a sign-writer since 1914. In May, 1942, while in hospital for treatment, no pulmonary symptoms were found. E.S.R. 19 mm. an hour. In September, 1947, a thyroid adenoma was removed. Chest *x*-ray examination at this time revealed moderate bilateral apical fibrosis with emphysematous changes at both bases. The process was well established and must have been developing for some time. He had only a slight cough and minimal shortness of breath. His arthritis in the preceding years had been mild and was considered to be "mildly active" when seen in 1947. In August, 1949, the rheumatoid arthritis was slightly worse; D.A.T., 1:64. In September, 1951, the arthritis was still troublesome, and chest *x*-ray examination revealed progressive pulmonary fibrosis. He was given a 32-day course of corticotrophin, which had only a transient effect on his arthritis and no effect whatever on his pulmonary lesions.

He was readmitted in August, 1953, with increasing dyspnoea, cyanosis, and clubbing of the fingers. An *x*-ray film (Fig. 2) showed apical fibrosis with honeycombing throughout both lung fields. E.S.R., 60–80 mm. an hour; Mantoux positive 1:1,000. Search for acid-fast organisms and malignant cells was persistently negative. $^{131}I$ uptake over lungs was nil, ruling out a possible metastatic thyroid lesion. Biopsy of rheumatoid nodule showed typical findings. He was discharged with a diagnosis of idiopathic pulmonary fibrosis. He died soon after, outside hospital. A necropsy was not done.

### Case 3

E. P., aged 58, was first admitted in 1949 with melaena and haematemesis, and later the same year for coronary thrombosis. She had severe rheumatoid arthritis, which had been present for 17 years. There were palpable glands in both axillae and the right supraclavicular fossa. Breath sounds were distant. B.P. was 150/110. Hands showed *main-en-lorgnette* deformity and ulnar deviation of fingers; there was marked limitation of movement of shoulders, elbows, and knees, and a nodule on the right elbow showing non-specific changes only on biopsy. A knee biopsy was compatible with rheumatoid arthritis.

An *x*-ray film of the chest (Fig. 3) revealed multiple ill-defined circular areas of increased density throughout both lung fields. A skull *x*-ray film revealed a large osteolytic defect in the left temporal region and smaller ones in left fifth rib. There was collapse of the ninth dorsal vertebra. Investigations for tuberculosis, primary or metastatic carcinoma, hyperparathyroidism, and leukaemia were negative. Plasma cholesterol, calcium, and phosphorus were normal; alkaline phosphatase, 54 to 22 K.A. units; E.S.R., 60 mm.; colloidal gold test, 5; D.A.T., 1:32. Mantoux positive 1:100.

It was considered that the lesions resembled xanthomatosis. Past history and a review of old *x*-ray films taken in 1932 revealed that at that time she had almost exactly similar pulmonary lesions for which she received a "virtual death warrant" and deep *x*-ray therapy. Her rheumatoid arthritis began a short time after this treatment for her pulmonary lesions. She died with coronary thrombosis. No necropsy was done. The pulmonary and skeletal lesions were attributed to a xanthomatous process. This, however, was not proved.

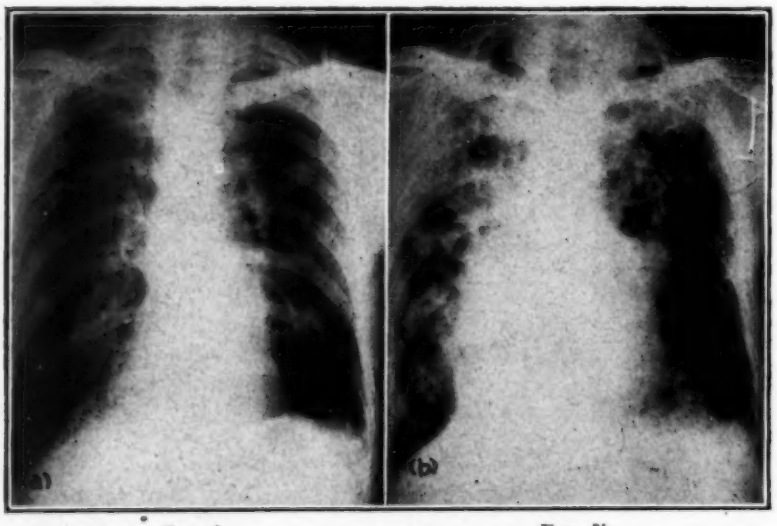


FIG. 2a FIG. 2b

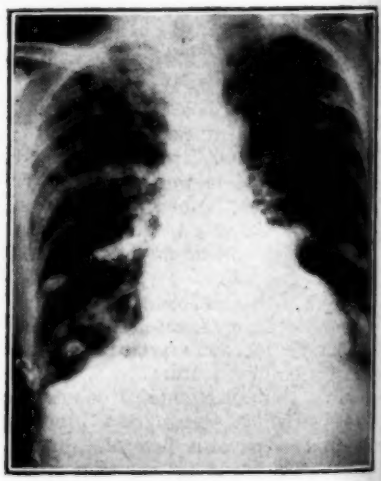

FIG. 3

FIG. 2.—A. D., Case 2. Postero-anterior views of chest. (a) September, 1947, showing apical fibrosis with basal emphysema. (b) August, 1953, showing progression of fibrosis with honeycombing of both lung fields. FIG. 3.—E. P., Case 3. Postero-anterior view of chest in November, 1951, revealed multiple circular opacities in both lung fields, known to have been present in 1932, when a diagnosis of malignant secondary defects in the lungs had been made. Note osteolytic lesions in left fifth rib

### Case 4

D. S. was affected with blindness due to congenital microphthalmia in the left eye and corneal opacities in the right eye. In 1940, at the age of 56, she developed rheumatoid arthritis involving the hands, wrists, knees, and feet. Her arthritis progressed slightly over the years, but was never very severe, and she was able to dress herself with only slight difficulty. E.S.R. varied between 5 and 30 mm. an hour. She had had an episode of pleurisy 15 years previously, which preceded the onset of her arthritis. There was a positive family history of tuberculosis. In 1949 multiple papillomata were excised from the tongue. In 1952 she received *x*-ray therapy for senile keratosis of the face, and a year later a chest *x*-ray film (Fig. 4) revealed diffuse mottling and streaking of both lung fields. She had no symptoms

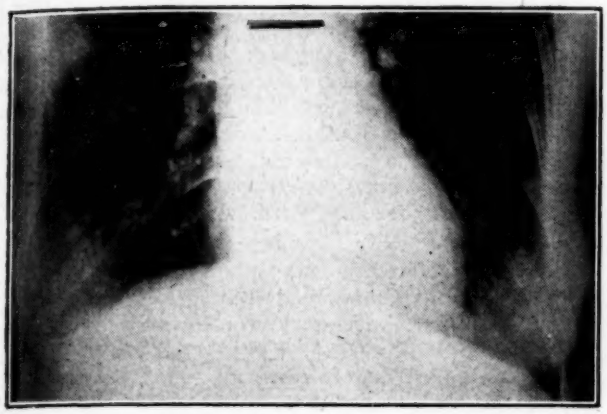

FIG. 4.—D. S., Case 4. Postero-anterior view of chest, 1953, showing diffuse mottling of both lung fields, most marked at bases.

referable to the respiratory system, no history of pulmonary infections or any exacerbations of her arthritis. In January, 1953, after a bout of influenza, she developed diabetes insipidus, which was readily controlled with pitressin tannate. The chest *x*-ray film remained unchanged. Investigations for acid-fast bacilli and carcinoma were negative. E.S.R., 30 mm.; D.A.T., 1 : 128. Mantoux positive 1 : 1,000. Lymph-node biopsy showed reticular and follicular cell hyperplasia.

In view of the sudden appearance of diabetes insipidus and its frequent association with Boeck's sarcoid and xanthomatosis, and in view of the otherwise negative investigations, a presumptive diagnosis of Boeck's sarcoid or xanthomatosis was made to explain the pulmonary findings.

## Comment

These four cases illustrate the difficulty encountered in determining the aetiology of pulmonary fibrosis. In each case the patient had been observed for many years. The only associated disease was rheumatoid arthritis of varying severity. In the face of repeatedly negative findings and by the process of exclusion it was easy, but intellectually unsatisfactory, to implicate the rheumatoid process.

In Case 1 the pattern of events could well have fitted the "rheumatoid lung syndrome." Two and a half years after the onset of pulmonary signs and symptoms a squamous-cell carcinoma was found. It is reasonable to assume that this lesion could well account for the course of events in this patient.

Case 2 had rapidly developing pulmonary fibrosis, which was noted at the time of surgical removal of a thyroid adenoma five years after the onset of rheumatoid arthritis. The lesion was well advanced prior to operation and progressed post-operatively until the patient was finally incapacitated. This patient's arthritic disease was relatively mild. Investigations neither revealed any cause for the pulmonary fibrosis nor suggested even a presumptive alternative diagnosis. There was no evidence of scleroderma. It was considered that, in view of the relatively low-grade rheumatic process, there was probably no relationship between his arthritic disease and the pulmonary fibrosis.

Case 3, with severe rheumatoid arthritis of 17 years' duration, when first seen in 1949 was found to have a widespread mottling in both lung fields. Investigation failed to uncover a causative agent. The pulmonary lesion was considered at that time to be possibly related to her rheumatoid disease. Old *x*-ray films taken in 1932 showed a similar picture before the onset of rheumatoid arthritis. A causal relationship between the two processes was therefore possible at the onset. Latterly she developed osteolytic lesions in the skull and ribs, which suggested a diagnosis of xanthomatosis.

Case 4, an elderly woman with mild rheumatoid arthritis, was found to have pulmonary reticulation on chest *x*-ray examination 10 years after the onset of her arthritis. No previous chest films were available for comparison. Her arthritis was never severe and she had no respiratory complaints. At no period in the recorded history was there an episode which could be characterized as the "rheumatoid lung syndrome." The relation of the pulmonary lesions to her arthritis could, however, not be ruled out. She later developed diabetes insipidus, which suggested that the pulmonary changes might have been due to sarcoidosis or xanthomatosis.

In each case a "rheumatoid" aetiology of the pulmonary lesions was entertained. Subsequently an alternative diagnosis was considered more probable. Thus pulmonary lesions are only rarely associated with rheumatoid arthritis. When observed, a careful search should be made to rule out transient or persistent pulmonary infiltration seen in scleroderma, disseminated lupus erythematosus, rheumatic fever, asthma, angioneurotic oedema, allergic states, periarteritis nodosa, Löffler's syndrome, Boeck's sarcoid, atypical pneumonia, congestive failure, and organizing albuminoid exudates of uraemic states. Frequently no aetiological agent can be found. Continued and prolonged observations will often bring to light the underlying process.

## Summary

The case histories of 253 patients with rheumatoid arthritis, chest *x*-ray findings of 130 of these and of 130 non-rheumatoids, and post-mortem findings of 42 rheumatoid cases and 42 controls were reviewed to determine the incidence of pulmonary lesions in a rheumatoid and non-rheumatoid series of patients.

1. No specific lung lesion was found which could characteristically be associated with rheumatoid arthritis.

2. The clinical and post-mortem incidence of various non-specific pulmonary lesions appeared to be rather greater in the rheumatoid patients than in the control series, but no one particular lesion was outstanding.

3. In patients with clinical and radiological evidence of pulmonary disease, no temporal correlation was observed with exacerbations of rheumatoid disease.

4. In this comparatively small group of patients studied, no example of what has been described as "rheumatoid lung" or "rheumatoid lung syndrome" was observed.

5. Four cases are cited in detail, illustrating what have been in our experience the most difficult of the problems of differential diagnosis of lung lesions in rheumatoid arthritis.

Our thanks are due to Professor J. H. Dible and his staff for the use of their pathological observations, to the late Professor Duncan White and Dr. Robert Steiner and their staff for

radiological data, to Dr. M. D. Milne for permission to include Case 1, and to Dr. C. M. Fletcher and other colleagues at the Postgraduate Medical School for advice.

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# CLINICAL AND CHEMICAL STUDIES IN HUMAN LACTATION

## X. THE MAINTENANCE OF BREAST-FEEDING

BY

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In all parts of Britain the official policy is to promote breast-feeding whenever possible, yet its success seems to vary greatly from one area to another. For example, at the end of three months the proportion of women fully breast-feeding varied from 24% in Newbiggin-by-the-Sea (Hughes, 1948) to 58% in Luton (Dykes, 1949).

It is not easy to understand why such variations occur. In any case, exact comparison between different centres is often impossible because results are expressed in different ways, and the populations studied are not fully described in terms of social class, age, parity, etc. This paper describes how such factors affect breast-feeding rates in Aberdeen. The incidence of successful breast-feeding is defined as the proportion of babies wholly fed on the breast during the first three months of life. After three months mothers commonly introduce other feeds, and it is difficult to know what contribution breast milk is making to the child's total food intake.

Discussion of the literature is confined mostly to those British publications in which comparable information is available. Since there is some evidence (Ross and Herdan, 1951) of considerable changes in breast-feeding habits, only publications of the past ten years are quoted.

### Factors Affecting Breast-feeding

#### Social Status

Most authors agree that breast-feeding is usually more successful in the upper social classes. Ross and Herdan (1951) found in Bristol that women in Social Classes I and II breast-fed longer than those in Social Classes IV and V, but their figures did not include cases of failure during the first four weeks.

Spence *et al.* (1954), in the "thousand families" survey in Newcastle-upon-Tyne, found 42.5% of mothers in Social Classes I and II, 34% in Social Class III, and 29% in Social Classes IV and V wholly breast-feeding after three months. Westropp (1953), studying 574 mothers in Oxford "who regularly attended the Oxford Child Health Survey for at least a year" found that 66% of those in Social Classes I and II, 54% in Social Class III, and 44% in Social Classes IV and V completely breast-fed for four months. Douglas (1950), using material gathered in the 1946 Maternity Survey of England and Wales, found that wives in the professional and salaried classes breast-fed more often for three months than the wives of manual workers; in his investigation a baby was considered to be breast-fed until it was completely weaned. On the other hand, Dykes (1949), in a survey of all infants born in Luton in 1945, found no social class difference in the duration of breast-feeding, and Dummer (1949) found no clear-cut differences in breast-feeding performance between occupational groups.

Women delivered in nursing-homes appear to breast-feed longer than those delivered in hospitals, who in turn breast-feed longer than women delivered at home (Hughes, 1948; Dummer, 1949; Dykes, 1949; Douglas, 1950; Campbell and Cheeseman, 1954; Spence *et al.*, 1954). The possibility that social class differences may have accounted for these findings, at least in part, was not investigated by those authors.

#### Maternal Age

Westropp (1953) found the duration of breast-feeding to decrease with age in primiparae, but Douglas (1950), using the national sample, found that maternal age had little effect when parity and social class were taken into account, although "young mothers appear to be more likely to stop breast-feeding in the first three months." Miller (1952) found no difference in the incidence of full breast-feeding at three months in primiparae aged above or below 35 or in multiparae aged above or below 40; only patients who left hospital breast-feeding were studied.

#### Parity

Dykes (1949), Douglas (1950), and Spence *et al.* (1954) found parity to have little or no influence on breast-feeding, but Westropp (1953) found that second and third babies were breast-fed longer than first or fourth and later babies, except in Social Classes I and II, where the breast-feeding performance improved progressively with increasing parity. Miller (1952) found that, of those leaving hospital breast-feeding, slightly more primiparae than multiparae were still breast-feeding at three months.

#### Physique and Health

Westropp (1953) found that maternal height, weight, and height/weight ratio did not affect the duration of breast-feeding. Miller (1952), however, found that considerably fewer women under 5 ft. (152 cm.) were breast-feeding at three months than taller women, and that somewhat more women "over the average weight for their height and age" were breast-feeding at three months than those who were underweight. Westropp found that women whose health was "uniformly good after delivery" breast-fed more successfully than those whose health was impaired.

The findings in these various studies are so diverse that there is justification for further inquiry.

## Method

In August, 1953, all the available health visitors' records for single legitimate children of Aberdeen women delivered in 1951 were examined, and the length of time up to six months that surviving children were fully breast-fed was determined.

In 1951, 2,769 such infants were delivered in the city of Aberdeen; 2,097 (76%) at the Aberdeen Maternity Hospital, 206 (7%) in the private nursing-home, and 466 (17%) in their own homes. Of this total, some had left the city before their records were complete and for some there were no data available. The numbers who were thus excluded are shown in the Table. Of Social Class I and II mothers, 18% had left the city, compared with 9% of Social Class III and 5% of Social Class IV and V. Moreover, a greater proportion of Social Class I and II mothers refused visits from the health visitors. It is not considered that these exclusions introduce serious bias into the trends seen in the analysis of the 2,404 cases left for study.

TABLE I

| Type of Case* | Total No. | Left City | No Data | Total Excluded |
|---|---|---|---|---|
| Maternity hospital | 2,097 | 174 | 91 | 265 (13%) |
| Nursing-home .. | 206 | 36 | 24 | 60 (29%) |
| Domiciliary .. | 466 | 29 | 11 | 40 (9%) |
| Total .. | 2,769 | 239 | 126 | 365 (13%) |

* Cases booked for each service irrespective of transfer to hospital.

The breast-feeding information was transferred from the health visitors' records on to punched cards, which are prepared routinely by the University Department of Midwifery for all Aberdeen deliveries. Since details of maternal height, general health, social class, and housing were often missing for cases not delivered in the Aberdeen Maternity Hospital, the investigation of these factors was based on the Maternity Hospital booked cases. First and second deliveries in hospital booked cases are believed to be fairly representative of the city as a whole; in later parities, selection factors make it necessary to exercise caution in generalizing from hospital data (Baird and Thomson, 1954).

## Results

At the age of 3 months, 35.6% of the 2,404 infants studied were wholly breast-fed, and after 6 months 24.5% were still feeding from the breast, although most were then receiving supplementary food. For babies delivered at the Aberdeen Maternity Hospital the figures were 35.6% and 25.7%; for

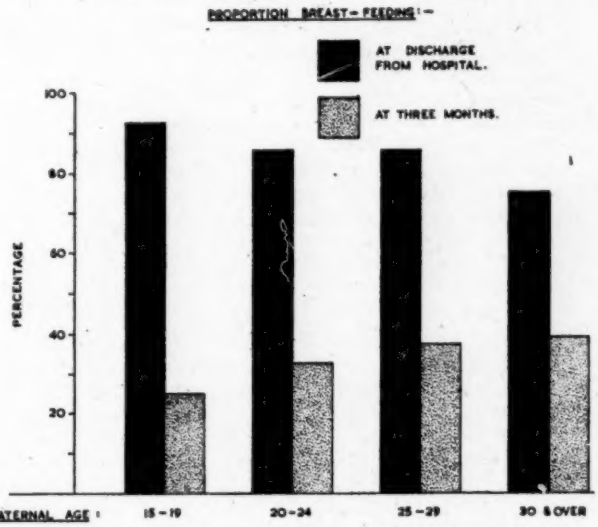


FIG. 2.—Contrast between breast-feeding rates at the time of discharge from hospital and at three months in different age groups. Aberdeen Maternity Hospital, booked married patients, 1951.

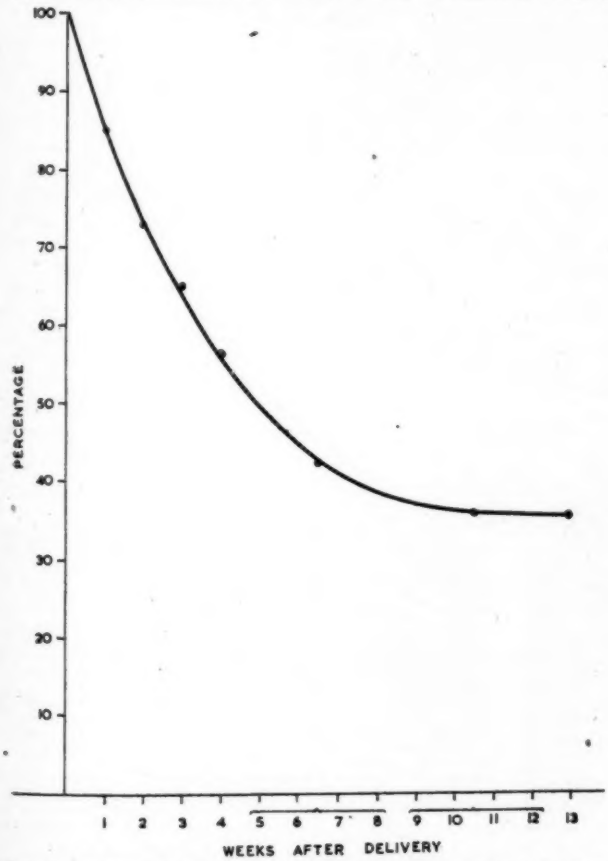


FIG. 1.—Falling incidence of full breast-feeding during the first three months. Aberdeen Maternity Hospital, booked married patients, 1951.

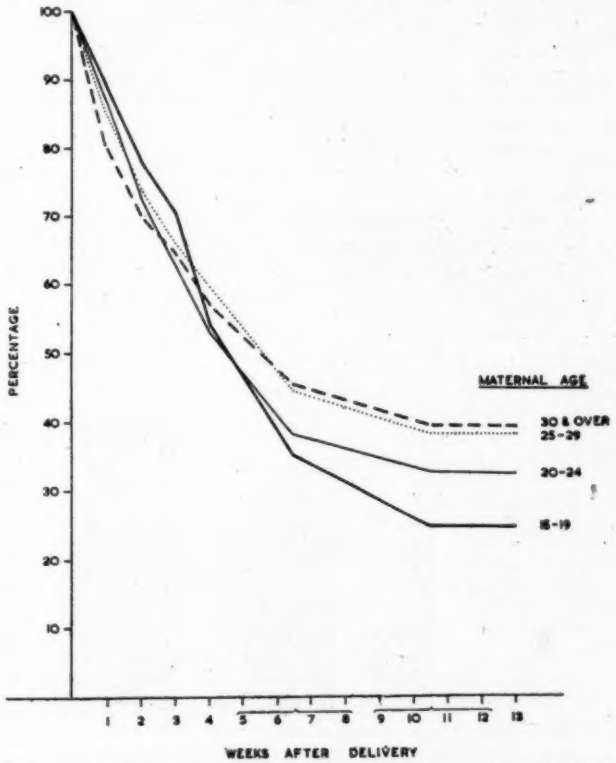


FIG. 3.—Falling incidence of full breast-feeding during the first three months in each age group. Aberdeen Maternity Hospital, booked married patients, 1951.

those delivered in the private nursing-home 44.5% and 28.8%; and for those delivered in their own homes, 32.4% and 20.2%. Therefore, although the incidence of breast-feeding at three months in the nursing-home mothers was considerably above the average and in women delivered at home it was below average, in women delivered at the Aberdeen Maternity Hospital it was almost identical with the average for the whole Aberdeen population.

Fig. 1 shows that the incidence of breast-feeding decreases rapidly during the first few weeks and then more slowly; about two-thirds of those who are not breast-feeding at three months have stopped during the first month, and if breast-feeding is continued into the second month it is likely to be maintained until the end of three months at least.

### Age

Fig. 2 shows that while the proportion of women breast-feeding at the time of discharge from hospital, about 10 days after delivery, declines with maternal age, the position is completely reversed at three months, when older mothers are more likely than younger mothers to be breast-feeding. Fig. 3 shows that the change in trend takes place during the three or four weeks after leaving hospital, when the rate of breast-feeding declines rapidly in younger women and more slowly in older women. At three months, only 25% of women under 20 years of age were still breast-feeding, compared with 39% of women over 30.

### Parity

Fig. 4 shows that the incidence of breast-feeding at three months was higher after second than after first pregnancies, and then declined with increasing parity. This was broadly true of all age groups except that women under 20 with a second baby have a very poor breast-feeding performance. The parity pattern appeared to hold also within social classes; however, an analysis on this basis could only be done on the Aberdeen Maternity Hospital series, and there were not sufficient numbers in the highest and lowest social groups to permit definite conclusions to be drawn.

### Social Class

There were well-marked social-class differences in the incidence of breast-feeding at three months (Fig. 5). Social Class I and II had the lowest breast-feeding rate during the first week, probably because of a higher average maternal age and a high proportion of primiparae; but of those who were still breast-feeding at the end of the first month almost 80% were still breast-feeding at three months. In Social Class III, and to a greater extent in Social Classes IV and V, although the mothers had an initial advantage because they were younger, breast-feeding was not well maintained and the incidence fell more steeply. The lines in Fig. 5 have crossed by the end of the second week, after which time Social Classes I and II had the highest breast-feeding rate. At three months the incidence of breast-feeding in Social Classes I and II was 50%, in Social Class III 36%, and in Social Classes IV and V 31%; a similar social-class gradient is present within age and parity groups, though the

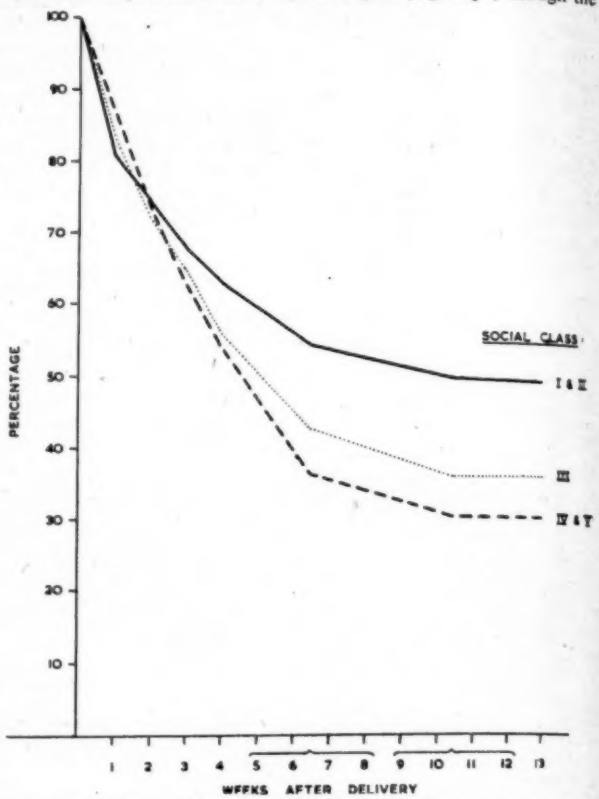


FIG. 5.—Falling incidence of full breast-feeding during the first three months in three social class groups. Aberdeen Maternity Hospital, booked married patients, 1951.

data for third and later babies are erratic, possibly owing to selection of abnormal cases for hospital confinement.

The comparatively high breast-feeding incidence at three months (45%) in women delivered at the private nursing-home and the comparatively low breast-feeding incidence (32%) in women delivered in their own homes may be largely determined by the social-class difference between the groups. The majority of women delivered in the nursing-home were from Social Classes I and II, and only 35% of them were of third or higher parity. Most women delivered at home were from Social Classes IV and V, and 80% of them were of third or higher parity.

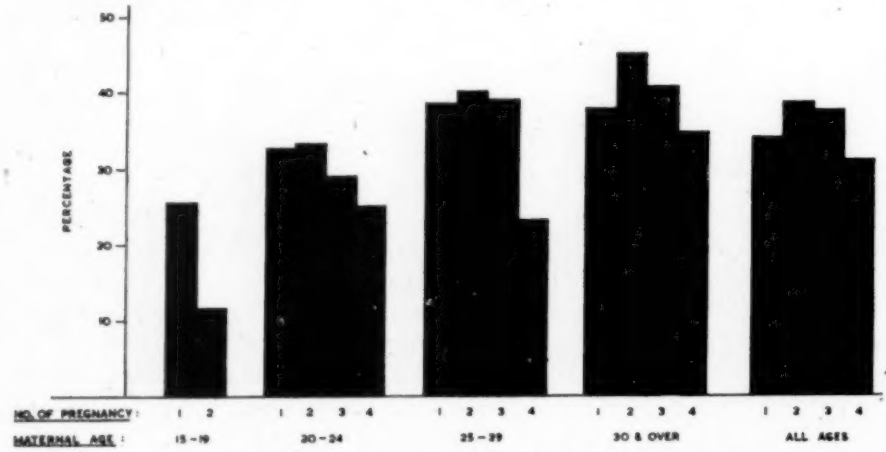


FIG. 4.—Incidence of breast-feeding at 3 months by parity in each age group. All married women delivered in Aberdeen city, 1951.

### Height and Physical Grade

Fig. 6 shows that at the end of three months 42% of women of 5 ft. 4 in. (163 cm.) or more were still breast-feeding compared with 31% of women under 5 ft. 1 in. (155 cm.), and 34% of women of intermediate height. Similar trends with height are apparent within each social-class group. The superiority of tall women is also evident in each age and parity group.

Of those women graded as of "good" or "very good" physique and health at the first visit to the antenatal clinic, 40% breast-fed for three months, compared with 31% for those graded "fair" and 23% in those graded "poor" or "very

poor." Similar trends occurred within each age, parity, height, and social-class group.

### Housing

Breast-feeding was assessed in relation to the degree of overcrowding in the mothers' homes, with the following results :

| | | |
|---|---|---|
| 1 person per room or less | 42% | breast-feeding at 3 months |
| 2 persons per room | 35% | " " " " |
| More than 2 persons per room | 28% | " " " " |

These differences disappeared when social classes were considered separately.

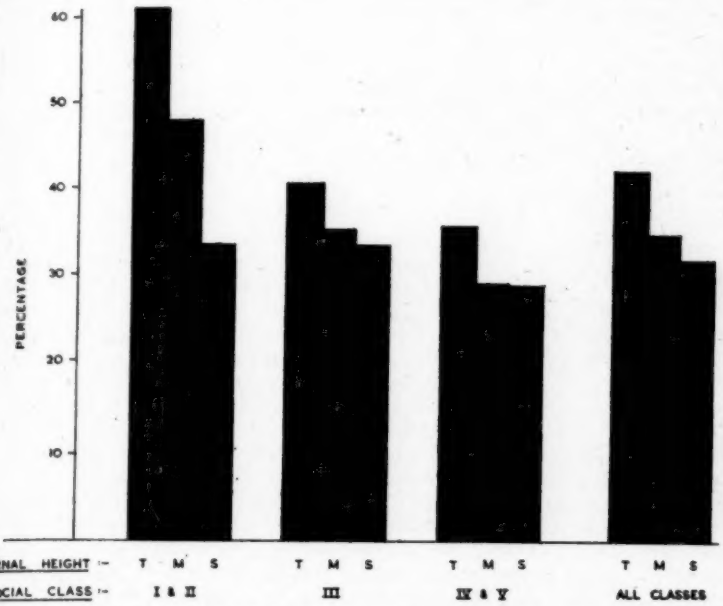


FIG. 6.—Incidence of breast-feeding at 3 months by height in each social class group. Aberdeen Maternity Hospital, booked married patients, 1951. Tall (T) = 5 ft. 4 in. (163 cm.) or more. Medium (M) = over 5 ft. 1 in. (155 cm.) but under 5 ft. 4 in. (163 cm.). Small (S) = under 5 ft. 1 in. (155 cm.).

## Discussion

At the age of 3 months about 36% of Aberdeen infants are still wholly breast-fed. This rate is similar to many reports which have been made recently : 33% from Newcastle-upon-Tyne (Spence *et al.*, 1954), 36% from Bristol (Ross and Herdan, 1951), 41% from Newbiggin (Hughes, 1948), and 44% from England and Wales as a whole (Douglas, 1950). It is, however, much lower than the rates reported in smaller selected groups. For example, Blaikley *et al.* (1953) reported that 70% of 222 primiparae under special supervision were breast-feeding at three months; Westropp (1953) obtained the same result in women attending the Oxford Child Health Survey ; and Naish (1949) had a rate of 67% in 100 consecutive cases under her own care.

As already stated, the breast-feeding rates at three months in the Aberdeen nursing-home, hospital, and domiciliary groups were respectively 44%, 36%, and 32%. None of the patients was receiving any special treatment to promote breast-feeding. Fig. 6 shows that when the hospital patients are subdivided by social class and height the rates range from 61% in tall women in Social Classes I and II to 29% in small women in Classes IV and V. Within each social class, tall women breast-fed most successfully.

Height may be regarded as a measure of efficiency of growth ; tall women are usually healthier than small women and are found more often in the upper social classes (Baird, 1949, 1952 ; Baird and Illsley, 1953). Our findings are consistent with the belief that both health and environment affect the incidence of breast-feeding at three months, but the relative influence of each is not easy to assess separately. It is extremely difficult to isolate the precise factors in health and environment which are important and which are not ; good physique, diet, education and housing, sufficient domestic assistance, easy access to skilled advice, and helpful attitudes are all likely to promote breast-feeding. Where many such factors are concurrent, as is usual in the upper social classes, the breast-feeding rate is likely to be high. Conversely, the breast-feeding performance of women in the lower social classes is likely to be impaired by a host of adverse circumstances acting together.

The data presented are in marked contrast to those obtained for breast-feeding at the time of discharge from hospital (Hytten, 1954a). Success or failure in hospital depends to a much less extent upon social class and height, and, whereas increasing maternal age is associated with a falling incidence of breast-feeding in hospital, the reverse is true at three months post partum (Fig. 2); the cross-over occurred at about the end of the first month, when all age groups had a similar breast-feeding incidence (Fig. 3), and it is interesting to note that in Newcastle (Spence *et al.*, 1954), where maternal age was not found to be related to the incidence of breast-feeding, only the figures at one month were examined. About 16% of women leave the Aberdeen Maternity Hospital feeding the baby wholly or partly on the bottle. It was shown that the main causes of failure were physiological or medical rather than social—inadequate milk production, illness or prematurity of the baby, or abnormalities of the breasts or nipples. The mothers who go home breast-feeding are therefore a selected group, probably less prone to failure from such physiological or medical causes. Subsequent breast failure is, however, much more commonly related to attitudes of mind, way of life, and general health and physique.

It is by no means easy to elucidate the precise reason or reasons for failure in a given case, and the mother's explanation may be misleading. We have attempted, with the help of social field workers, to determine the main causes of failure by correlating information derived from hospital records, health visitors' and clinical reports, and from the women themselves, in a sample of married primiparae ; but the information, though extensive, was frequently very indefinite. Perhaps the commonest cause given was that the supply of breast milk became inadequate, and this view was often supported by the women's medical supervisors. Yet in most cases no satisfactory evidence was available that the nutrition of the baby was inadequate—for example, poor growth or insufficient milk output determined by test-weighing. In many instances the change from breast to bottle was made suddenly and without adequate investigation of the difficulty, although it was usually stated that the family doctor had been consulted and had advised bottle-feeding. As a rule, it seemed that the mother gave up breast-feeding without regrets, and sometimes she had been under pressure from friends and relatives to do so.

We met a few cases where an apparently circumstantial story of inadequacy of lactation did not stand up to investigation : for example, the wife of a colleague contacted one of us in her second month post partum to say she was thinking of giving up breast-feeding. The baby was irritable and restless and did not seem to be satisfied. Supplementary feeds from a bottle during the preceding few days were thought to have been beneficial. She had consulted her doctor, who agreed that her milk might be insufficient and that bottle-feeding was advisable. On detailed inquiry it appeared that the baby's ill-health had begun only about a week previously and was associated with coryza ; until then the baby had been gaining weight steadily and doing well. Test-weighing did not confirm that the breast milk output was unsatisfactory, and it was recommended that she might persist for a little longer. The baby recovered from its

"cold" and was soon progressing normally again on breast-feeding alone. There is no doubt that had breast-feeding been abandoned the mother would have subsequently given a plausible story of lactation failure.

The physical and emotional pleasure which is so often claimed for breast-feeding is by no means universal, and the maintenance of breast-feeding often requires considerable perseverance. Naish (1947) has pointed out that the nursing mother is emotionally less stable than usual, and requires more rest. We have observed that she is liable to tiredness, vague ill-health, and minor infections. Since breast-feeding cannot be delegated, her social activities are often restricted and the domestic routine has to be accommodated to the baby's feeding-times. If for any reason the mother's confidence about her baby's progress on the breast is shaken—as may happen if either suffers from a minor illness or disability—she is not unlikely to think that her milk is "inadequate." It is well known that bottle-feeding can give good results; it may be strongly recommended by friends and relatives and even by doctors, and, after all, the mother herself can "see what he's getting."

There is, nevertheless, some reason to think that in many cases the breast milk is in fact insufficient. It has been estimated, from studies of seventh-day breast milk (Hytten, 1954b), that about one-third of women may be unable, because of deficiency of milk yield or fat content or both, to breast-feed adequately for more than a few weeks. The causes of such deficiencies may be nutritional or inadequacy of breast function, possibly of genetic origin.

### Calorie Requirements

Even if the breasts are capable of adequate milk production, calculation indicates that production may be impaired by an inadequate diet. For milk of average composition the infant's requirements will rise from 500 ml. during the first month (providing 330 calories, or about 50 calories per lb. body weight for a 6½-lb. baby) to about a litre at four months (providing 660 calories, or about 50 calories per lb. for a 13-lb. baby). It has been estimated that the efficiency of conversion of energy intake into milk energy is about 60% (Food and Agriculture Organization of the United Nations, 1950). On this basis, the mother's requirements for milk production would be approximately 550 calories at the beginning of lactation, rising to 1,100 calories after about four months, or higher if the energy value of her milk is greater than average. To this must be added her maintenance requirements. With the modest allowance of 2,100 calories for maintenance, this gives daily totals of roughly 2,700 to 3,200 calories for a *moderately* active lactating woman. Relatively few urban women are accustomed to eating a diet containing 3,000 calories, and it is by no means certain that the stimulus of extra appetite is always present in sufficient degree; again, it is possible that some women may have difficulty in dealing with the extra metabolic load. The cost of these extra calories is by no means negligible, and is, in fact, very much greater than the cost of feeding the same infant on subsidized National dried milk.* No doubt many women can produce the required milk, even in the absence of an adequate diet, by draining their own body stores and tissues, but it is doubtful if this can be done for any length of time without loss of physical energy and well-being, and without loss of body weight.

Thus, breast-feeding, once established, is most likely to be successfully maintained by healthy women who take and have the appetite for a sufficient diet, who can take the responsibilities of caring for a baby in their stride, who believe that breast-feeding is best, and whose confidence is not seriously shaken by intercurrent morbidity. These circumstances are more common in the well-grown and educated women in the "upper" social groups. That these women are taller and healthier has been shown by Baird and Illsley (1953); their diet provides more energy and is more nutritious (Thomson, unpublished); and in the antenatal period they more often express the intention to breast-feed and more often carry out their intention (Baird and Scott, 1953). Such women, however, tend to be older than average, and, while this does not prejudice the long-term maintenance of breast-feeding in those whose lactation is adequate, a greater proportion have inadequate lactation and therefore fail at a relatively early stage.

The somewhat better breast-feeding performance in second than in first lactations is to be expected. The mother has the advantage of previous experience and has a higher milk yield (Hytten, 1954c). It may be more difficult to breast-feed a third or later baby, since the mother has the additional domestic responsibility of attending to previous children while feeding and caring for the latest baby. Selection factors may also come into play, as many mothers, particularly those in the upper social groups, do not have more than two children.

### Need for Further Investigation

In order to determine precisely in any particular case why breast-feeding fails after the mother leaves hospital, much more intensive methods of investigation will be needed. The investigator, preferably a doctor, must be readily accepted into the patient's home and must be able to discuss the baby's feeding dispassionately and at frequent intervals, with full knowledge of all the circumstances, domestic as well as medical, *and without giving the woman the impression that he is taking sides for or against breast-feeding.* This last condition is very difficult to satisfy, yet it is crucial, since patients are well aware of the bias of most obstetricians, paediatricians, and public-health workers in favour of breast-feeding. Unless they feel free of guilt in expressing a preference for bottle-feeding, the truth may be concealed. Investigation should include regular weighing of mother and baby and assessment of their state of health.

Some of the questions such an investigation must attempt to answer are these: Do the deficiencies in milk output and fat content suggested by the analysis of the seventh-day milk (Hytten, 1954b) cause early failure of breast-feeding associated with failure of the baby to thrive? What effect has an inadequate diet on the mother's health and weight and on her milk? What are the circumstances surrounding failure of breast-feeding in women whose milk has been shown to be adequate, and to what extent is this determined by the social background: the mother's attitude to breast-feeding, the opinion of friends and relatives, public-health teaching, and domestic circumstances?

It is hoped to report the result of inquiries on these lines at a later date.

## Conclusions

After breast-feeding has been established, its maintenance is largely determined by good maternal health and favourable social circumstances.

In the city of Aberdeen in 1951 the overall incidence of breast-feeding at the end of three months was about 36%—a similar figure to that of other recently reported studies—but the incidence varied widely within the population. For example, 61% of tall women from Social Classes I and II were fully breast-feeding at three months compared with 29% of small women in Social Classes IV and V.

Good health and good social circumstances are closely interrelated, and imply a wide range of advantages from good physique and diet to good education and sensible attitudes. The relative contributions of all these factors to the promotion of breast-feeding are not easy to determine, and further research along lines described in the text is required.

*It has been estimated, by costing some diets taken by Aberdeen mothers, that the extra calories required to produce average breast milk for the first four months will cost about 7s. weekly, or about £6 per lactation. The cost of National dried milk, together with the required sugar and orange juice for four months, is about 12s., or one-tenth the cost of breast-feeding.

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# WERNER'S SYNDROME

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In 1904 Otto Werner, whilst a medical student working in the Ophthalmological Clinic at Kiel, studied four brothers and sisters suffering from the syndrome which now bears his name, and which he described as "cataract in connexion with scleroderma." It was not until 1934 that Oppenheimer and Kugel first drew attention to the condition in America. In 1941 they reported the first post-mortem examination on a case. Thannhauser (1945) reviewed all the reported cases and literature up to that date. Subsequently, cases have been recognized with increasing frequency, although only one brief report has appeared in the English literature (Williams, 1949).

Werner's syndrome is characterized by a habitus the features of which are short stature, thin tapering limbs, a protuberant abdomen, and stocky trunk. The hair is fine and prematurely grey, whilst it is sparse or absent in the axillae and over the pubes. The disease usually appears about the third or fourth decade with presenile cataracts. Other important features are osteoporosis and diabetes mellitus, together with evidence of hypogonadism (small genitalia, sterility, and menstrual disturbances). The limbs are wasted, thin, and tapering, the legs being affected more than the arms. The skin is tense and shiny, and has a hide-like quality. Ulceration is frequent, and particles of calcium are deposited in the skin, giving rise to a condition known as calcinosis circumscripta.

The following case histories are of two sisters. A brother appears to have had a similar condition, and died in 1937; no clinical or pathological evidence is available. The other seven members of this generation of ten children in the family do not appear to be affected.

## Case 1

A woman aged 51 was admitted to hospital on November 27, 1952. A right-sided cataract had been removed in 1942. Her vision in that eye remained satisfactory for nine years, but in the past year it had again become blurred. During the past seven years she had been developing a cataract of the left eye. As long as she could remember her legs had been thin, and over the past 20 years she had been unable to stand or walk for any time because of an aching pain in her feet, which was relieved by sitting. The skin had always been dry with a sallow brown pigmentation. There was no history of thirst, polyuria, loss of weight, spontaneous fractures, or cramp-like pain in the legs. Menstruation began at 17, was often irregular and scanty, and ceased at 46. She has never been pregnant.

Her father's grandmother died after a lifetime of bad feet and sight. The patient was one of 10 children, 3 of whom had "matchstick legs" and large bellies, and developed cataract early in life. No further data can be found about one (a brother), but the other sibling was investigated four years ago at the same hospital as the patient, and from her records the second case is compiled.

Examination showed a placid thin-faced woman, looking much older than her age, with sparse grey hair, advanced cataract in left eye and a ground-glass appearance of cornea on right; diffuse golden brown pigmentation; spider naevus below left eyebrow and another above right nipple; well-covered trunk, protuberant abdomen (Fig. 1), limbs very thin, with practically no subcutaneous or muscle tissue; skin dry everywhere on limbs and face, but normal on trunk. Feet had trophic claw-like appearance with ulcer over right heel (Fig. 2). Nails normal. Cardiovascular and respiratory systems normal. B.P. 160/80. Alimentary system.—Tongue and teeth healthy. Abdomen very well covered; doughy and resistant on palpation; liver, spleen, and kidneys not felt; no free fluid. Umbilicus normal. Central nervous system.—Right

FIG. 1.—Photograph of Case 1.

FIG. 2.—Case 1. Showing trophic claw-like appearance of foot.

pupil fixed; left pupil reacts to light and accommodation; neither fundus visible. Right corneal reflex diminished. Otherwise no abnormality in cranial nerves. Sterno-mastoids normal. Upper limbs.—Very thin; wasting slightly less marked at upper third of upper arm; tone, power, co-ordination, and all modalities of sensation preserved intact; tendon reflexes present, but very sluggish. Lower limbs.—Distribution of loss of tissue as in arms; both ankle-joints and small joints of the feet ankylosed, and the skin appeared to be adherent to the periosteum; no other neurological abnormality.

**Investigations**

*Blood.*—Group A, rhesus-positive; Hb 76%, 76% (11 g.%), and 81% (12 g.%); red cells, 4,630,000 per c.mm.; C.I. 0.8; white cells, 5,900 per c.mm. (72% neutrophils); E.S.R., 79 mm. in 1 hour (Westergren). Bleeding-time, 3 minutes; clotting-time, 13 minutes (capillary method); prothrombin concentration, 50%. After treatment with vitamin K parenterally the latter values became 1½ minutes, 10½ minutes, and 100% respectively. Blood urea, 30 and 40 mg. per 100 ml. Serum calcium, 10.6 and 9.8 mg. per 100 ml. Serum inorganic phosphate, 3.6, 4, and 3.5 mg. per 100 ml. Alkaline phosphatase, 8, 6, and 9 units (King-Armstrong). Acid phosphatase, 1 unit. Plasma proteins, total 8 mg.% (albumin 5.6 g., globulin and fibrinogen 2.4 g.). $CO_2$ combining power, 61.3 vols.%.

*Glucose Tolerance Test.*—Fasting level of 290 mg. per 100 ml., rising to 600 mg. after 30 minutes, and remaining at 540 mg. two hours after the administration of glucose.

*Urine.*—Albumin, 0.09 g. per litre; glucose, ++++; no acetone (Rothera's test). Total excretion of inorganic phosphates in 24 hours, 4,715 and 3,675 mg.; 24-hour excretion of calcium, 92 mg. per 100 ml.

Renal function tests: urea clearance, 42.4%, 64.35%, and 26% of normal at 1, 2, and 3 hours (Van Slyke); phenolsulphonphthalein, 18%, 24%, and 6% at 1, 2, and 3 hours respectively; 24-hour excretion of amino-acids (paper chromatography) showed that the excretion of only one amino-acid was significantly raised—aspartic acid. Urinary keto-acids (24-hour excretion): L-ketoglutamic acid, 24.2 and 19.9 mg.; pyruvic acid, 8.4 and 18.2 mg. Aceto-acetic acid was absent. 24-hour urinary excretion of 17-ketosteroids, 4,725 mg.

*Faeces.*—Examination of single specimen: total fat, 13%; split fat, 7%; Unsplit fat, 6%. Of the fat, 50% was split and 47% unsplit.

*Liver.*—Aspiration biopsy: Very firm liver tissue encountered; aspiration failed to produce liver tissue.

## Case 2

A woman aged 42, a sister of Case 1, was admitted to hospital under Dr. C. R. Gibson on January 12, 1948, with an ulcerating condition of her feet, from which spicules of "bone" had been discharged six months previously. A cataract had been removed from the right eye nine years earlier, and one subsequently developed in the left eye. One month previously severe thirst, polyuria, pruritus, and loss of weight had led to a diagnosis of diabetes. The menopause occurred at the age of 32; there were no children. Her weight was 5 st. 3 lb. (33.1 kg.).

Examination showed severe wasting of the limbs, below mid-thigh and middle of arms, simulating peroneal muscular atrophy. Over the distal part of the limbs the skin was atrophic and shiny, with patches of brown pigmentation; there were five ulcers on the right foot and one on the left; she had bilateral pes cavus and cataract in the left eye. Secondary sex characteristics: breasts normally developed; axillary and pubic hair normal. Cardiovascular and respiratory systems normal. B.P. 170/80. Alimentary system.—Tongue clean, teeth false; abdomen full, no free fluid; liver edge felt two fingerbreadths below right costal margin, firm and smooth. Central nervous system.—Apart from muscle-wasting in limbs, nothing abnormal found; tendon reflexes sluggish but equal; sensations normal.

**Investigations**

*Urine.*—Albumin, cloud; sugar present; no amino-acids in crystal form; scanty pus cells; Bence Jones proteose, negative. Renal function.—Urea clearance moderately diminished to 54% of normal. 17-ketosteroids, 1.7 g. per litre (assuming total 24-hour urine dispatched, which is doubtful, as specimen totalled only 735 ml.).

*Blood.*—Hb 70%; red cells, 3,930,000; C.I., 0.89; white cells, 6,000 per c.mm. (polymorphs 46.5%, lymphocytes 50%, monocytes 2.5%, eosinophils 1%); platelets plentiful. Serum calcium, 14.8 mg. per 100 ml. (not repeated); serum phosphate, 2.75 mg. per 100 ml.; alkaline phosphatase, 4.3 units; acid phosphatase, 1.7 units; thymol turbidity, 2 units; colloidal gold, 0.

Her diabetes was insulin-resistant. She died in September, 1952, at home, of metastases from a melanotic sarcoma which had appeared over the right hip a year previously. Her doctor reports that by this time she was blind with cataract, and the skin was dry and parchment-like, with no appreciable subcutaneous tissue. As soon as one ulcer on the feet healed another appeared, and occasionally "sequestra" were extracted therefrom.

## Skeletal Survey

### Case 1

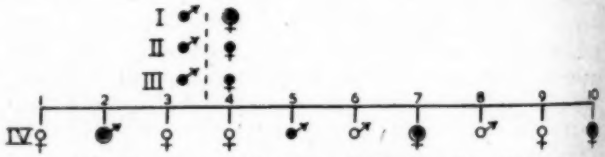
*Skull.*—There is well-marked hyperostosis frontalis interna. The remainder of the vault appears slightly osteoporotic.

*Lower Limbs.*—The lower ends of both femora show slight osteoporosis with a few small cystic areas. There is calcification in the quadriceps tendon on the right side at its insertion into the patella. Both tibiae and fibulae show very marked decalcification with cystic-looking areas present. In places the cortex is so thin as to be scarcely visible. There are similar, even more marked, changes in both feet and ankles. On both sides there is calcification at the site of insertion of the tendo Achillis. On both sides there is linear calcification adjacent to the dorso-medial margin of scaphoid in the soft tissues, and on the left side there is further calcification at the base of the fifth metatarsal in the soft tissues. There is marked flexion deformity of the toes. The bases of the third and fourth metatarsals on both sides appear to be partially fused.

*Dorso-Lumbar Spine and Pelvis.*—The vertebral bodies appear rather osteoporotic, as does also the lower part of the sternum. The pelvis appears normal.

*Upper Limbs.*—There are small irregular areas of translucency in the radius and ulna, more marked in the ulna on both sides. The cortex is of normal or almost normal thickness. The carpal bones are not noticeably decalcified. The metacarpals and phalanges all appear more translucent than normal, with multiple cystic areas, particularly noticeable in the phalanges. The periphery of all the subungual expansions is very dense. A few small areas of calcification lie scattered in the soft tissues of the hands.

Nothing abnormal was found in the chest and the renal tracts (plain film and I.V.P.).




Key to the family tree. I. Paternal grandmother died after a lifetime of "bad feet and bad sight." IV.—1 (female): Died in infancy. 2 (Male): Died aged 50+; cataract and matchstick limbs; had three children. 3 and 4: Two sisters in Canada; both healthy, with big families; one weighs 20 st., the other 15 st. 5: Healthy man; died of dysentery in 1914–18 war. 6: Male, of normal build and health. 7: *Case 1.* 8: Healthy man of normal build. 9: Female, always pale; swollen knuckles. 10: *Case 2*, died 1952.

### Case 2

The appearance of the bones is strikingly similar to that of Case 1, though rather more pronounced in all areas. Case 2 also shows some calcification at the insertion of the tendo Achillis, and there is well-marked calcification in arterial walls in the feet and legs, and to a less extent in the pelvis and thighs. Some tiny areas of calcification lie scattered in the soft tissues of the feet and hands, and there is one linear area lying under the head of the first metatarsal of the right foot.

## Discussion

These two cases fulfil the diagnostic criteria of Werner's syndrome: the characteristic habitus—striking wasting of the limbs contrasting with a well-covered trunk and protuberant abdomen, osteoporosis, metastatic calcification, diabetes, cataracts, hypogonadism, and skin changes—was present in both sisters. An unusual feature was the striking resistance to insulin, both patients receiving at one time over 100 units of insulin with little effect on their glycosuria and no hypoglycaemic episodes. In previous descriptions of Werner's syndrome the diabetes has appeared to be mild and insulin-sensitive.

The ulceration of the feet and legs in Case 2 has been seen in many of the cases previously reported. It is usually ascribed to metastatic calcification rather than simple ulceration over pressure points. The calcareous discharge from these sores is more likely to be of this origin than sequestra.

The fatal termination of Case 2 with a melanotic sarcoma is probably significant. Cases have been described in which death has occurred from primary hepatomata (Oppenheimer and Kugel, 1941; Case 2) and sarcoma of the left radius (Oppenheimer and Kugel, 1941; Case 3).

None of the aetiological theories so far advanced explains this syndrome adequately.

Oppenheimer and Kugel (1941), whose post-mortem report is the only one available, described the presence of multiple adenomata of the thyroid, parathyroid, and suprarenal cortex. In consequence, these writers proposed an endocrine basis for Werner's syndrome. Certainly hypogonadism, diabetes, and osteoporosis fit well within this concept, which has been accepted by Williams (1949) and Brink and Findlay (1950). Williams (1949) found a normal level of 17-ketosteroid excretion in his case, a male, but an unduly high proportion of this was of suprarenal origin, and this suggests a primary gonadal deficiency.

In neither of our cases does it appear likely that 17-ketosteroid excretion was significantly depressed, but there is little doubt regarding the presence of clinical hypogonadism. Although both women were married, neither had conceived; this is in contrast with their sisters, described as large women of normal configuration who had families of varying size.

The patterns of endocrine syndromes are now well recognized, and it is difficult to reconcile the pleomorphic features of Werner's syndrome with these. It seems probable that the endocrine features of the syndrome are secondary to the fundamental pathological process, whatever that may be. In this respect an analogy might be made with haemochromatosis, with its sequels of insulin-resistant diabetes mellitus and hypogonadism; a point in this connexion is the clinical evidence of hepatic fibrosis in our cases. Serum iron and copper studies, however, gave normal values.

Thannhauser (1945), in an exhaustive review of the literature on Werner's syndrome, and Schott and Dann (1949), reject the endocrine theory. Their explanation that the condition originates in a defect of the germ-plasm which does not manifest its effects until the third or fourth decade is impossible to dispute, although it fails to cast any further real light on the subject.

The association in Werner's syndrome of albuminuria, impaired renal function, glycosuria, skeletal decalcification, and clinical evidence of hepatic fibrosis raises the possibility of its relationship to the group of innate defects of renal tubular reabsorption, which includes the Fanconi syndrome and cystinosis.

It is our belief that this relationship is more apparent than real, for the following reasons. Firstly, we were unable to demonstrate an increase or alteration in the urinary spectrum of excreted amino-acids, with the questionable exception of aspartic acid.

Secondly, the characteristic habitus of Werner's syndrome is not encountered in these conditions; nor are the widespread defects of ectodermal tissues. In contrast, rachitic dwarfism, with which the tubular defects may present, has not been described in Werner's syndrome.

Thirdly, glucose-tolerance tests consistently show that the glycosuria of Werner's syndrome is a true diabetes. The glycosuria of the Fanconi syndrome and related conditions, however, is renal in origin, although occasionally impairment of glucose tolerance is encountered where there has been previous restriction of carbohydrate intake (Anderson, Miller, and Kenny, 1952).

The fourth major point of distinction between Werner's syndrome and the renal tubular defects lies in the character of the bone lesions. These are due to osteomalacia in Fanconi's syndrome, nephrocalcinosis, and cystinosis. Neither of our cases of Werner's syndrome, however, nor those reported in which there has been adequate biochemical examination, have fulfilled the criteria for a diagnosis of osteomalacia as stipulated by Albright and his associates (1946). Thus the serum calcium, phosphorus, and alkaline phosphatase were normal even though gross skeletal demineralization was present.

In our two cases of Werner's syndrome the only biochemical abnormality of the blood was an isolated discovery of hypercalcaemia in Case 2. Taken in conjunction with the probable hyperphosphaturia of Case 1, this raises the question of a hyperparathyroid contribution, in addition to hypogonadism.

Finally, biochemical examination of our two patients showed no evidence of the hyperchloraemia or acidosis met with in hyperchloraemic acidosis and occasionally in Fanconi's syndrome. The reaction of the urine was variable. Ammonia production was not studied.

The parallelism of the features of this syndrome with much of the natural history of dystrophia myotonica raises the question of their relationship. The onset of dystrophia myotonica at the third or four decade with the features of cataract, baldness, and hypogonadism in this heredofamilial muscular disease come to mind. It is probable that these two diseases are associated in some way.

## Summary

Two cases of Werner's syndrome are described, with a brief review of the literature, which contains only one reported post-mortem examination. The clinical features of the disease are discussed in relation to the nature of the condition.

It is a pleasure to acknowledge the permission of Dr. C. R. Gibson to publish the second case, and our thanks are due to Dr. H. Lovell Hoffman for his clinical collaboration, advice, and criticism.

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# HEPATIC NECROSIS AND OTHER VISCERAL LESIONS ASSOCIATED WITH PHENYLBUTAZONE THERAPY

BY

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Toxic manifestations during phenylbutazone ("butazolidin") therapy for rheumatic disease have been recorded by many observers, and in some series of cases the incidence is over 40% (Freeland *et al.*, 1953; Cudkowicz and Jacobs, 1953; Bruck *et al.*, 1954). Fatalities have also been observed and necropsy findings reported. It is the purpose of this paper to place on record the necropsy findings in another fatal case.

## Case Report

A married woman aged 73 was first seen on April 30, 1954, when she gave a history of mild rheumatic pains of many years' duration. On the previous day she awoke with severe pain and swelling of small joints of her right hand. This spread during the day to her right wrist and elbow, and on the morning of the 30th had started in the left metacarpo-phalangeal joints.

On examination her temperature was 100.2° F. (37.9° C.), pulse 90 and regular, and respirations 20. The affected joints were red, tender, and swollen. Movement was very limited and painful. The small joints of both hands, both wrists, right elbow, and right shoulder were affected. Her weight was 8 st. 8 lb. (54.4 kg.). Urine: S.G. 1014; no albumin or sugar present. B.P. 130/60. E.S.R. 40 mm. in first hour. Serum sodium, 290 mg. per 100 ml.; serum potassium, 24 mg. per 100 ml.

As the arthritis was very acute and spreading rapidly she was given cortisone acetate by mouth, starting with a dose of 100 mg. a day; this was rapidly increased to 200 mg. with satisfactory results, her joints showing improvement, with disappearance of the redness and swelling and a return of the lost movements.

Some difficulty was experienced in reducing the dosage, as each reduction was followed by a return of the arthritic symptoms. From June 12 to 16 she was given three 200-mg. phenylbutazone tablets a day, a total of 20 tablets being given. This was done to tide her over the symptoms due to the withdrawal of cortisone. She left hospital on July 2 on a maintenance daily dose of 50 mg. of cortisone. Her weight was 8 st. 7 lb. (54 kg.)

When readmitted on July 24 she stated that she had taken no cortisone since July 17, as she had noticed that her ankles and feet were swollen. Her B.P. was now 150/60. She was breathless at rest, with signs of congestive heart failure. Her joints were again painful and swollen. Her E.S.R. was 110 mm. in one hour; serum sodium, 314 mg. per 100 ml.; and serum potassium, 32 mg. per 100 ml. She was given phenylbutazone from August 5 to 15, three 200-mg. tablets a day; total tablets, 33. On August 15 the phenylbutazone was stopped, as examination revealed impaired resonance with weak breath sounds and numerous rales over the upper zone of the right lung and signs of an effusion at the left base.

*X*-ray examination confirmed the presence of a pleural effusion on the left side and revealed dense mottling in the right upper and middle lobes and to a less extent in the right lower lobe. There also appeared to be a dense area near the left hilum. Some enlargement of the cardio-vascular shadow was present with some slight calcification of the aortic arch.

*Since deceased.

Her blood picture on August 20 showed: Hb. 11.5 g. (72%); red cells, 3,500,000; white cells, 7,500 (lymphocytes 17%, monocytes 2%, polymorphs 75%, eosinophils 4%, basophils 2%). She also complained of nausea and a dry mouth. There was never any sign of jaundice or ascites. She now developed a moderate albuminuria.

On August 22 the serum sodium was 314 mg. per 100 ml. and serum potassium 20 mg. per 100 ml. She died on August 23. From June 12 to 18 4 g. of phenylbutazone was given, and from August 5 to 15 6.6 g.—a total of 10.6 g.

### Summary of Post-mortem Findings

*External Appearance.*—Characteristic changes of rheumatoid arthritis; generalized oedema; no jaundice.

*Body Cavities.*—About three pints (1.7 litres) of clear amber-coloured fluid in each pleural cavity.

*Circulatory System.*—Heart: weight, 627 g.; mitral valve cusps slightly thickened; hypertrophy of left ventricle and papillary muscles; fibrosis and calcification of aortic valve; epicardium and pericardium covered by dense shaggy exudate, beneath which were scattered tubercle-like nodules. Blood vessels: slight atheroma of coronary arteries and aorta, with focal calcification in the aortic arch.

*Respiratory System.*—Lungs: weight—right 913 g., left 513 g.; upper lobar oedema and congestion most marked on right side; moderate bronchiectasis; small area of pleural thickening right apex. Trachea: frothy mucus present.

*Spleen.*—Weight, 199 g.; pattern retained.

*Gastro-intestinal Tract.*—Stomach: numerous fundal mucosal erosions.

*Liver.*—Weight, 1,482 g.; diffuse mottling and congestion.

*Pancreas.*—Nothing of note.

*Genito-urinary System.*—Kidneys: weight—right 151 g., left 143 g.; scattered white cortical streaks and prominent vascular markings. Bladder: haemorrhagic cystitis. Uterus: calcified interstitial leiomyomata.

*Central Nervous System.*—Permission for examination of brain refused.

*Endocrine Glands.*—Thyroid adenomatous; small accessory thyroid present on left side.

*Adrenals.*—Nothing of note.

## Histology

*Heart.*—There was interstitial oedema of the myocardium with focal collections of polymorphonuclear cells, often numerous, with histiocytes, plasma cells, lymphocytes, and pigment-laden macrophages. Only an occasional eosinophil could be found. None of these cellular aggregations showed any definite relationship to blood vessels. The latter showed fibrillar scarring of the rheumatic type. The muscle fibres showed considerable variation in their nuclei as well as degenerative changes. The endocardium was normal, except in the left auricle, where it was thickened. No cellular infiltrations were found in or beneath it. The epicardium was greatly thickened and nodular. Its surface showed patchy areas of caseous necrosis with polymorphonuclear infiltration beneath which there were epithelioid cells arranged in a radial fashion with giant-cell formation. The innermost layer consisted of a diffuse collection of lymphocytes, plasma cells, polymorphonuclear cells, with some fibroblasts. The blood vessels were dilated. A section taken from the left auriculo-ventricular groove showed a collection of cells between the coronary artery and the auricular myocardium (Fig. 1). Epithelioid cells were arranged in a palisade around a central area of necrosis with peripheral lymphocytes and plasma cells. The necrosis was of the complete or caseous type.

*Lungs.*—These showed a moderate amount of oedema with scattered polymorphonuclear cells in the fluid. Strands of fibrin lay free in many of the alveoli, and some of them showed early organization while others were arranged in strip-like fashion against the alveolar walls. A striking feature was the presence of large atypical mononuclear

cells in all parts of the lungs. Their nuclei were basophilic, and occasional giant-cell formation occurred. No typical Aschoff cells were found. Plasma cells could be seen in moderate numbers. There was thickening of the alveolar walls and focal emphysema. A large bronchus showed bronchiectasis. There were perivascular collections of mixed cells, but the vessel walls showed no change. At the site of the pleural scar the pleura was thickened by fibrosis, anthracosis, and lymphocytic infiltration. Part of it was necrotic, and the histological picture was the same as that described for the epicardial lesion in Fig. 1. A tracheo-bronchial lymph node showed sinus catarrh and anthracosis.

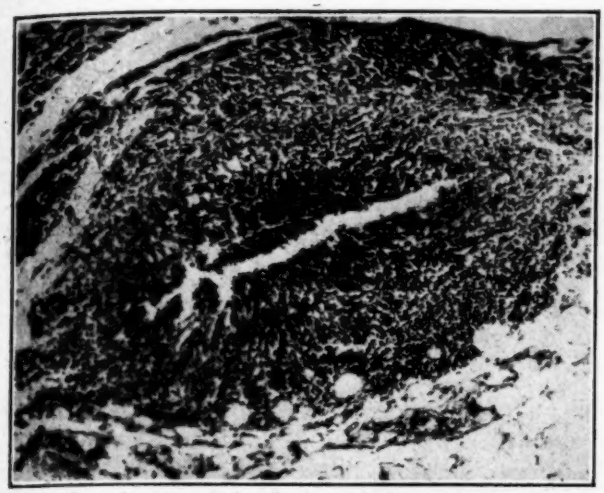

FIG. 1.—Granulomatous lesion in the auriculo-ventricular groove.

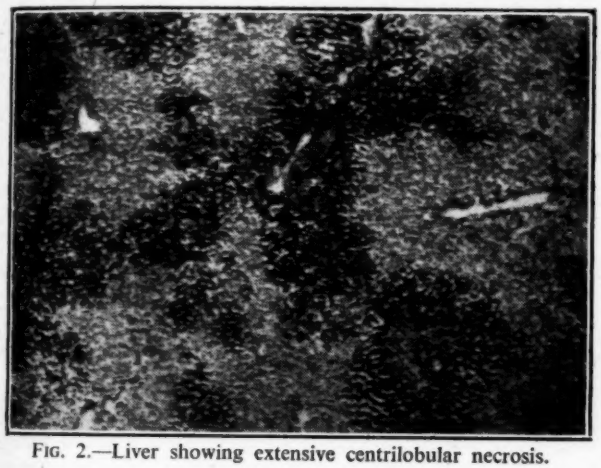

FIG. 2.—Liver showing extensive centrilobular necrosis.

*Liver.*—There was extensive necrosis of parenchymatous cells of centrilobular distribution (Fig. 2). The outlines of the liver cell cords were preserved, but the areas involved were infiltrated by polymorphonuclear cells. The Kupffer cells remained intact. There was slight congestion of the central venous part of the lobules. The remaining liver cells showed toxic nuclear changes, with cytoplasmic fat present in moderate amounts. There was minimal parenchymatous regeneration. Lymphocytes in insignificant numbers were present in the portal areas.

The *spleen* showed congestion of the pulp, which was infiltrated by polymorphonuclear and plasma cells.

The *adrenals* showed some abnormal vacuolization in the cells of the zona fasciculata.

*Kidneys.*—The glomeruli were within normal limits. There were widespread degenerative changes in the tubules, particularly in the convoluted tubes. Some of these were necrotic, but there was no cellular infiltration. Hyaline casts were also present.

The *bone marrow* was moderately hyperplastic, of normoblastic type.

Special stains failed to reveal the presence of tubercle bacilli or other organisms in the granulomatous lesions. The caseous necrosis in these areas did not stain for fibrin.

## Discussion

The dosage in this case, 600 mg. a day, is that most often used, but it is noticeable that there was an interval between the two courses of treatment of nearly two months. The total number of days—18—on which phenylbutazone was given was not large, nor was the total dosage of 10.6 g.

The histological findings fall into three main categories: (1) necrotic parenchymatous lesions in the liver and kidneys; (2) granulomata in the epicardium, pericardium, and lungs; and (3) interstitial myocardial lesions.

The hepatic and renal lesions are similar to those found in chemical poisoning, and in this instance they were almost certainly due to phenylbutazone administration. Necrosis of this degree in both organs, and with this distribution in the liver, has not previously been described as caused by phenylbutazone. There have been reports of milder hepatic damage in other cases of rheumatoid arthritis receiving phenylbutazone. In Nassim and Pilkington's (1954) patient who recovered, a liver biopsy revealed "foci of focal necrosis into which infiltration with mononuclear cells has occurred, and there is also some accumulation of mononuclear cells in the portal tracts." Engleman *et al.* (1954), in the U.S.A., described six cases of jaundice due to this drug, with two deaths. The first case coming to necropsy showed "infiltration of portal spaces with polymorphonuclear and mononuclear cells. Projecting from the portal spaces were septal strands of fibrous tissue which were also infiltrated with inflammatory cells. Adjoining liver cells showed degenerative changes, and a smaller number were necrotic. The pathological changes are those of acute toxic hepatitis." The second case received phenylbutazone for 10 days, after which it was stopped because of vomiting; death occurred 40 weeks later, and the liver showed toxic cirrhosis. Other causes for this liver change were ruled out.

The renal tubular damage in the present case was of the isolated nephrotic type. Degeneration of the convoluted tubules was described by Bruck *et al.* (1954) in a patient who died of oliguria and renal failure while receiving phenylbutazone for rheumatoid arthritis, but the kidney showed old pyelonephritic and hypertensive changes. In Johnson and Larkin's (1954) case, death occurred in a patient with contracted kidneys who was on the same treatment.

There are at least three possible explanations for the granulomatous lesions: (1) That they are rheumatic manifestations, either unmodified or modified by drug therapy; (2) that they are of infective (tuberculous, viral, or fungal) origin; (3) that they are a direct hypersensitivity reaction to phenylbutazone.

The histological changes in the epicardial and pleural lesions are those of the rheumatoid nodule that have been previously described in these sites (for review see Ellman *et al.*, 1954). A striking feature in the case now presented is that the necrosis in those lesions was not fibrinoid but was caseous in character. Ellman *et al.* (1954) found a similar change in their case of rheumatoid arthritis with widespread serous membrane involvement by rheumatoid nodules. Their patient received no phenylbutazone, but had cortisone for 71 days. This may be of some significance, since our patient received the hormone for 77 days. Is it possible that this form of treatment could account for the atypical necrosis in an otherwise typical rheumatoid nodule?

An alternative explanation to a rheumatic origin is the breakdown of a latent infective granulomatous focus by cortisone and/or phenylbutazone, a tuberculous focus being most probable. However, as was previously mentioned, no organisms were found and the lesions are not histologically typically tuberculous. The possibility of an aggravation of this type has to be considered in view of the work of D'Arcy

Hart and Rees (1950) on the influence of cortisone on the tuberculous lesion.

Granulomata of somewhat similar though not identical character to those under review have been found in other cases of phenylbutazone toxicity (Steinberg *et al.*, 1953; O'Brien and Storey, 1954). Associated vascular lesions of the hypersensitive type were present in both these cases, and when necrosis was found it was fibrinoid in type. Widespread microgranulomata were present. The changes in these patients are probably a direct hypersensitivity reaction to phenylbutazone, and they parallel those described by More *et al.* (1946) in persons dying from sulphonamide hypersensitivity. No vascular lesions were found in the patient in the present report, and the granulomata do not appear to originate from phenylbutazone hypersensitivity.

The interstitial myocarditis is non-specific and probably anaphylactoid. Apart from old paravascular fibrillar scarring, no rheumatic lesion was found. Similar myocardial lesions were also described by More *et al.*

The pulmonary histological changes, apart from the granuloma, have many of the characteristics of those described by Gouley and Eiman (1932) for "rheumatic" pneumonia of a proliferative type. These lesions are of a type which may occur in the lungs, independent of any form of therapy, during the course of an acute rheumatic attack. They draw attention to the importance of relating the findings in cases of drug toxicity to the known pathological findings in the diseased state for which the drug has been administered, as well as to the normal. Otherwise, toxic effects may be ascribed to the drug which it does not possess. The coincidence of acute rheumatic lesions and those of rheumatoid arthritis in the present instance also raises the question whether phenylbutazone may not be more toxic in such cases than in cases of simple rheumatoid arthritis.

It is reasonable to suggest that in this case the myocarditis, and the necrosis in the liver and possibly also in the kidney, were related to one another in so far as, with the development of the myocarditis, passive congestion supervened and the anoxia thus induced in the parenchymatous cells of the liver and kidney aided the development of necrosis by the toxic action of phenylbutazone.


### Summary

A fatal case of rheumatoid arthritis in a woman of 73 who received phenylbutazone and cortisone is reported. Necropsy revealed multiple pathological lesions, among which hepatic and renal necrosis were prominent; these lesions are ascribed to toxic action by phenylbutazone. An interstitial myocarditis was probably due to hypersensitivity to phenylbutazone. Pleural and epicardial granulomata were most probably modified rheumatoid nodules. Other pulmonary changes conformed to those found in acute rheumatic disease. The importance of relating the pathological changes found in cases of drug toxicity to the known changes found in untreated cases of the disease for which the drug is administered, as well as to the normal, is indicated.


We wish to thank Professor R. A. Q. O'Meara for much help and criticism and Mr. F. A. Murray for the photographs.


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# MEGALOBLASTIC ANAEMIA DUE TO PHENYTOIN SODIUM


BY

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The possibility that phenytoin sodium might produce a megaloblastic anaemia was first suggested by Badenoch (1954), who described two patients on phenytoin sodium therapy with a megaloblastic anaemia and with normal vitamin $B_{12}$ absorption. A total of five further cases have been reported by Hawkins and Meynell (1954), Chalmers and Boheimer (1954), Rhind and Varadi (1954), and Webster (1954), although one of the two cases reported by Chalmers and Boheimer probably had pernicious anaemia. Hawkins and Meynell mention one further example brought to their notice by Dr. J. F. Wilkinson.

Recently we have had under observation two patients with a megaloblastic anaemia and normal gastric acidity who were on phenytoin sodium therapy. In order to determine the frequency of the condition, the records of 56 patients with megaloblastic anaemia who were admitted to Whiston Hospital during the last four years were studied, but no further cases were revealed. In addition, blood examinations were made on 102 epileptic patients in Rainhill Mental Hospital, all of whom had been taking phenytoin sodium for several years, and the laboratory records of 140 patients with a haemoglobin value below 70% in Rainhill Hospital during the last four years were surveyed. None of the 102 epileptic patients had a megaloblastic anaemia, but one possible case was discovered from the survey of the records (Case 3).

### Case 1

A man aged 32 was admitted to Whiston Hospital in February, 1953; he had had dyspnoea on exertion and lassitude for three months. His diet had been adequate, and there was no history of haemorrhage. He had previously been healthy except for attacks of grand mal, which started in 1939. During the last five years he had been taking 1 gr. (65 mg.) of phenobarbitone and 300 mg. of phenytoin sodium daily, which completely controlled the epilepsy. On examination he was thin (weight 8 st. 1 lb.—51.3 kg.), there was pallor of the skin and mucous membranes, ulcers were seen on both legs, and his temperature was 102° F. (38.9° C.). The tongue and gums were normal, the spleen was not palpable, and there were no abnormal neurological signs. The chest *x*-ray examination showed consolidation in the left mid-zone.

*Laboratory Investigations.*—R.B.C., 770,000 per c.mm.; Hb, 36% (5.2 g.%); W.B.C., 8,500 per c.mm. (normal differential count); P.C.V., 9%; M.C.V., 128 cubic $\mu$; reticulocytes 2%. Blood films showed macrocytosis, and the sternal marrow contained megaloblasts. Serum bilirubin, 0.7 mg. per 100 ml. Occult blood tests on three specimens of faeces were negative. No excess of faecal fat. A fractional test meal showed the normal amount of free hydrochloric acid.

*Treatment.*—Vitamin $B_{12}$, 100 $\mu$g., was given daily by the intramuscular route for the first week, and then twice weekly for six weeks. There was a small reticulocyte response of

11.8%, but the haemoglobin rose to 82% (12.1 g.%) within six weeks of the beginning of treatment. He was also given 500,000 units of crystalline penicillin eight-hourly for ten days for the pneumonia, which resolved completely. Phenytoin sodium was stopped at the time of his admission to hospital, but he continued to take ½ gr. (32 mg.) of phenobarbitone daily. In November, 1954, nineteen months after cessation of the vitamin $B_{12}$ therapy, he was feeling very well and had not had any further attacks of grand mal. His weight was 9 st. 3 lb. (58.5 kg.); the blood count was: R.B.C., 4,620,000 per c.mm.; Hb, 112% (16.6 g.%); W.B.C., 8,900 per c.mm.

### Case 2

A single woman aged 28 was admitted to Whiston Hospital in July, 1954, having had dyspnoea and lassitude for one week. Her appetite was good, but she had been on a weight-reducing diet. Menstruation was normal and there was no history of haemorrhage. She had previously been healthy except for attacks of grand mal, which had started at the age of 4 years. During the last eight years she had been taking 2 gr. (130 mg.) of phenobarbitone and 300 mg. of phenytoin sodium daily, and the epilepsy had been completely controlled during the previous four years. Examination revealed pallor of the skin and mucous membranes, oedema of the feet, and bruising on both arms and the left buttock; temperature, 103.8° F. (39.9° C.); weight 11 st. 9 lb. (73.9 kg.). The tongue and gums were normal, the spleen was not palpable, and there were no abnormal neurological signs. Chest *x*-ray films showed nothing abnormal.

*Laboratory Investigations.*—R.B.C., 1,090,000 per c.mm.; Hb, 26% (3.7 g.%); W.B.C., 5,200 per c.mm. (normal differential count); platelets, 98,000 per c.mm.; P.C.V., 13%; M.C.V., 130 cubic $\mu$; M.C.H.C., 29%; reticulocytes, 3%. Blood films showed macrocytosis, and the sternal marrow contained megaloblasts. Serum bilirubin, 1.6 mg. per 100 ml.; red-cell fragility test normal. Direct Coombs test negative. No excess of faecal fat. A fractional test meal showed the normal amount of free hydrochloric acid.

*Treatment.*—Crystalline penicillin, 500,000 units, was given twice daily for 18 days, but this had no effect on the pyrexia, which settled slowly during the following month as the anaemia improved. One and a half pints (750 ml.) of blood were given on the day after admission, and the haemoglobin value rose to 36%. One week later treatment with 45 mg. of folic acid daily by mouth was started, being continued for two months. This produced a reticulocyte response of 29%, and one month after treament was started the haemoglobin value had risen to 71%. Phenytoin sodium was stopped at the time of her admission to hospital, but she continued to take 3 gr. (0.2 g.) of phenobarbitone daily. In January, 1955, four months after cessation of the folic-acid treatment, she was feeling well and the haemoglobin value was 90% (13.3 g.%).

### Case 3

A single woman aged 27 developed lassitude and dyspnoea in March, 1952, when she was an in-patient in the epileptic ward at Rainhill Mental Hospital. She had had attacks of both petit mal and grand mal since 1943, and in addition there was considerable mental deterioration. No history of any other illness was elicited. At the time of her admission to Rainhill Hospital in February, 1951, she was taking 200 mg. of phenytoin sodium and 3 gr. (0.2 g.) of phenobarbitone daily, but it is not known for how long she had been taking phenytoin sodium before admission to hospital. The phenytoin sodium was stopped one month after admission, which was a year before the symptoms of anaemia were first noted. On examination there was pallor of the skin and mucous membranes, the tongue was normal, and the spleen was not palpable; her weight was 13 st. 4 lb. (84.4 kg.).

*Laboratory Investigations.*—R.B.C., 1,820,000 per c.mm.; Hb, 42% (6.2%); W.B.C., 7,900 per c.mm. (normal differential count); P.C.V., 21%; M.C.V., 115 cubic $\mu$; M.C.H.C., 30%; reticulocytes, 0.5%. Blood films showed a few late megaloblasts, and the sternal marrow contained megaloblasts. The van den Bergh reaction was negative. The faecal fat content and gastric acidity were not estimated.

*Treatment.*—Vitamin $B_{12}$, 100 $\mu$g., and folic acid, 15 mg., were given daily by the intramuscular route, and 6 tablets of "ferro-redoxon" daily for two months. This produced a reticulocyte response of only 8.5%, but the haemoglobin rose to 90% (13.3 g.%) within the two months. Treatment was continued with 2 ml. of "plexan" intramuscularly twice weekly, and in July, 1952, the haemoglobin level was 95%.

In August, 1952, she died during an attack of status epilepticus. Post-mortem examination revealed congestive changes in the lungs, liver, spleen, and kidneys, but no other abnormality.

### Discussion

It seems probable that phenytoin sodium was the aetiological factor in the first two patients, in whom none of the known causes of megaloblastic anaemia were evident. Unfortunately, the third patient was not investigated sufficiently to rule out the possibility of pernicious anaemia or steatorrhoea, but in view of her age and good nutritional state these diagnoses are unlikely. It is improbable that phenobarbitone produced the anaemia, for in two patients its administration was continued for 18 months and four months respectively after cessation of treatment for the anaemia without a relapse occurring. In addition, the absence of a relapse after stopping treatment makes it unlikely that these were cases of idiopathic megaloblastic anaemia, such as those described by Davidson (1948).

Only two (3.4%) out of 58 cases of megaloblastic anaemia admitted to Whiston Hospital in the last four years could be attributed to phenytoin sodium. The rarity of the condition is demonstrated further by the fact that no cases were discovered from a survey of 102 patients who were taking phenytoin sodium, and only one possible case was revealed by a study of the Rainhill Mental Hospital laboratory records for the last four years. In view of the rarity of this condition and the excellent response to treatment the use of this drug is not contraindicated. It is probably wiser, however, to change to another anticonvulsant drug in those patients who develop a megaloblastic anaemia.

Of the total of 10 cases which have been described, seven were treated initially with vitamin $B_{12}$, but only four showed a good response. On the other hand, there was a good response in the two patients treated with folic acid initially and in three patients who were given folic acid after vitamin $B_{12}$ had failed. Badenoch (1954) showed that the serum vitamin $B_{12}$ level and the vitamin $B_{12}$ absorption were normal in his two patients, and yet one of them who was treated with vitamin $B_{12}$ responded well. In view of these findings it is difficult to explain the pathogenesis of the condition, and further study is required.

### Summary

Three cases of megaloblastic anaemia, which were probably produced by phenytoin sodium, are described.

This condition is rare, and no further cases were discovered from a survey of 102 epileptic patients on phenytoin sodium therapy. The anaemia is corrected by folic acid, but the response to vitamin $B_{12}$ is variable.

Our thanks are due to Dr. B. Finkleman for allowing us to study the records of Rainhill Mental Hospital, to Mr. W. Stirrup for carrying out the blood counts on the 102 epileptic patients, and to Dr. N. Bennett Jones for permission to publish Case 1.

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# CARDIOSPASM IN TWO BLOOD RELATIONS

BY

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We have found no reference in the literature to a family incidence of cardiospasm, and the discovery of two cases of this condition in blood relatives is therefore of interest.

## Case 1

A man aged 40 was admitted to hospital several days after the onset of an acute respiratory infection. Fever, cough, sputum, and right-sided pleuritic pain were associated with clinical evidence of consolidation at the right lung base, and he was thought to have a simple right lower lobar pneumonia. *X*-ray examination of his chest confirmed the presence of consolidation as well as that of some fluid, but it also demonstrated gross dilatation of the oesophagus, the appearance of which was typical of cardiospasm.

Further questioning of the patient then revealed that for over twenty years he had had difficulty in swallowing, and had often felt his food "sticking in his throat." His symptoms began in early adolescence, and he soon found that he could usually overcome the obstruction in his gullet by drinking large quantities of water both during and after meals. His dysphagia was always worse when he was worried or nervous or in a hurry, and frequently he was forced to regurgitate his food. The consequent chronic malnutrition had led to considerable emaciation. His dysphagia was first investigated when he was serving in the Army during the second world war. There had been a strong rumour that his unit was to be sent to the Middle East, and his comrades, knowing that he had to drink large quantities of water with all his meals, suggested to him that he would fare badly in the desert. Realizing the truth of this, he consulted his medical officer, and subsequent investigations demonstrated cardiospasm. No treatment was offered, but he was not posted to the Middle East. His affliction was so much a part of his daily routine that it did not occur to him to mention it to us when he was admitted to hospital on the present occasion, but it was certainly relevant to his presenting complaint, since his chest infection took the form of an aspiration pneumonia.

A barium swallow (Fig. 1) confirmed the diagnosis of cardiospasm already made from the straight *x*-ray film of the chest and from the history. An attempt was made to empty the oesophagus before the barium examination, and among the food secretions which were withdrawn were found the remains of vegetables which the patient had eaten some thirty-six hours before—an indication of the severity of the "spasm." Inhalation of octyl nitrite relieved the "spasm" momentarily during the initial *x*-ray screening, but, despite further inhalation, barium was still present in the oesophagus many hours later. There was no sign of oesophageal peristalsis during screening, and a study of the oesophageal motility by the balloon-kymograph technique described by Kramer and Ingelfinger (1949) showed extreme depression of motility and almost complete absence of the so-called secondary peristaltic waves in the middle and lower thirds of the oesophagus.

In view of the particularly severe symptoms a modified Heller operation was performed after the chest infection had been overcome. The dysphagia was completely relieved following the operation, and when last seen seven months later the patient was still symptom-free and had put on 2 st. (12.7 kg.) in weight. The symptomatic improvement was paralleled by the improvement in the radiological appearances. The chest film showed no evidence of an oesophageal shadow, and a barium examination revealed a considerable diminution in the size of the oesophagus, with little or no obstruction at the cardia. Oesophageal motility, however, was still minimal, as demonstrated both on the *x*-ray screen and on the tracing obtained by the balloon-kymograph technique.

## Case 2

Mrs. X, the maternal aunt of the patient in Case 1, visited her nephew while he was in hospital, and for the first time the two discovered that they suffered from the same complaint. Her symptoms were not nearly so severe as those of her nephew, but, like his, they began when she was a young girl. During her early adult life her dysphagia was a source of considerable embarrassment to her, but in later years she became more placid and swallowing was easier. A plain film of the chest showed evidence of cardiospasm, and this was confirmed by a barium swallow (Fig. 2). The "spasm" was not so marked as in Case 1 and there was quite obvious vigorous peristalsis in the lower oesophagus, confirmed by balloon-kymograph studies. Octyl nitrite had no effect on the "spasm."

FIG. 1.—Case 1.

FIG. 2.—Case 2.

## Comment

Mrs. X was one of a family of three brothers and three sisters, and Case 1 was the son of her elder sister. So far as could be discovered, no other member of the family suffered from this condition, but unfortunately the inquiry could not be very exhaustive, as three of Mrs. X's siblings had emigrated to America and could not be traced.

One of the common complications of cardiospasm is aspiration pneumonia, and repeated attacks may lead to bronchiectasis. It is not unusual, therefore, for the condition to be diagnosed first from a radiograph of the chest.

Individually the two cases described are fairly typical, but the familial incidence is most unusual. It is possible that this association is merely accidental, although the odds against such a coincidence must be enormous.

We should like to express our thanks to Professor D. M. Dunlop and to Dr. W. S. Shearer for permission to publish these two cases.

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# Medical Memoranda

## A Case of Pseudocyesis

A woman of 41 complained of "peculiar feelings" in the abdomen, pain in the breasts, and morning sickness. She had not menstruated for eight months. The abdomen "felt tight," and she said it was much larger than usual. Two successive pregnancy tests were negative, and she was shown the results; her comment was: "I question the tests. They may be wrong. I think it's an eight-months pregnancy." The sensations in her abdomen were described as "like a mouse."

She had married in 1947, and was most eager to have a child. No contraceptives were employed, yet she did not conceive. In 1953 her husband had an accident and went to hospital. This was the first separation in seven years of marriage; the patient was very disturbed by it, and very glad when he was discharged. "It was marvellous. Felt different. More response at intercourse." From this time forward, she had breast pains, felt sick in the mornings, noticed veins on the breasts, with some discharge, and thought herself heavier and bigger in the abdomen. She was quite convinced that these signs indicated a pregnancy. The urinary gonadotrophins were considerably raised.

About a week after her attendance at the clinic she experienced abdominal pain and had a bout of diarrhoea. "I felt something had burst, something to do with the baby." She felt better, and had more energy. The abdomen was "still fat, but not so hard. I felt the baby did start and now it's finished. Something passed away." Six weeks later she said: "I'm better now. I was certain about the pregnancy, but am satisfied now it wasn't." Her own explanation of the episode was: "Perhaps the shock of the accident altered the glands."

The intercourse with her husband which occurred after his discharge from hospital was more gratifying, and more intensely experienced, than it had ever been, and the patient then felt that at long last a child would be conceived. Her later history seems to show that the desire to conceive, if it is strong enough, can produce the subjective sensations of pregnancy, and some objective physical signs as well, even an alteration in endocrine balance. Her belief in the pregnancy remained unshaken by the negative tests, and persisted until the attack of diarrhoea, which signified to her that the "foetus" had been passed out.

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## Acute Osteomyelitis of the Maxilla in Infancy with Cavernous Sinus Thrombosis

Acute osteomyelitis of the superior maxilla in infancy is more common than is generally believed, athough only 21 cases have been described in the English and American literature since 1928. The usual aetiological agent is *Staphylococcus aureus,* penicillin-resistant strains of which have been encountered with increasing frequency of late, especially in hospitals and maternity units (Gairdner, 1954). Treatment with penicillin, although it has been successful in the past (Jacoby and Sagorin, 1945; Haworth, 1947; Macbeth, 1951), may therefore no longer be effective. McCash and Rowe (1953) have already reported two cases of osteomyelitis of the superior maxilla in 4-weeks-old infants caused by penicillin-resistant strains of *Staph. aureus*; in these cases there was further deterioration in the clinical condition after starting penicillin treatment. Both cases required surgical intervention and then eventually responded to treatment with chlortetracycline and streptomycin.

A case of osteomyelitis of the maxilla caused by penicillin-resistant strains of *Staph. aureus* and complicated by cavernous sinus thrombosis is described below. This patient received penicillin for four days before the antibiotic was changed to chlortetracycline and streptomycin, to which the organisms isolated from the pus were sensitive *in vitro*. By this time, however, the infection had spread to the cavernous sinus.

### CASE REPORT

The patient, the elder of twins, was born in hospital by breech delivery. Her birth weight was 5 lb. 9 oz. (2.5 kg.). She developed a "mild right-sided ophthalmia" on the third day of life. This was successfully treated with oral sulphadimidine, and she was discharged home aged 17 days. Four days after discharge she presented with swelling of the left side of the face associated with general fretfulness. Cellulitis was diagnosed and treatment with benzathine penicillin ("penidural") by mouth was begun (1,200,000 units daily in four divided doses). There was no improvement, and three days later she was admitted to hospital.

On admission there was an inflammatory swelling involving the left side of the face, nose, and hard palate. Pus was discharging from the gum margin in the left canine region. A diagnosis of osteomyelitis of the maxilla was made.

Crystalline penicillin, 2,000,000 units, was administered intramuscularly in divided doses during the next 24 hours, but the temperature continued to rise and the child vomited frequently. Both eyelids became progressively more oedematous, accompanied by increasing bilateral proptosis. Cultures from the pus grew two separate strains of *Staph. aureus,* resistant to penicillin but sensitive to streptomycin in both instances, and in one also to chlortetracycline and chloramphenicol. The treatment was therefore changed to oral chlortetracycline, 150 mg., and intramuscular streptomycin, 200 mg. daily in divided doses. This was continued for three weeks. Although the swelling of the face receded, and the amount of discharge of pus into the mouth decreased, the ocular signs became more pronounced, indicating thrombosis of the cavernous sinus. Gross oedema of both eyelids was present, with marked bilateral proptosis, diminution of the ocular movements, engorgement of the retinal veins, and slight bulging of the fontanelle.

Treatment with intravenous heparin was instituted as follows: A continuous intravenous drip infusion was begun and 500 units of heparin injected as an initial dose, followed by 250 units after four hours; the total amount given four-hourly was increased by 250 units each time. Thus after 48 hours the dose injected was 2,000 units and the treatment with heparin was discontinued. The clotting-time was estimated twice daily, and at the end of treatment was 13 minutes. The swelling of the eyelids disappeared during the period of heparin administration, but some bilateral proptosis and thrombosis of the right supraorbital vein persisted for another eight days.

After this the progress towards recovery appeared to be satisfactory until, three weeks after the onset of initial symptoms, the oedema of the right eyelids and right-sided ocular proptosis recurred. This was accompanied by a rise in temperature. The antibiotic treatment was changed from chlortetracycline to chloramphenicol, 350 mg. daily in divided doses for two weeks. As anticoagulant, oral phenylindanedione ("dindevan") was used instead of heparin, 20–30 mg. daily in two divided doses being given for 10 days. This dose was effective in maintaining the prothrombin index in the region of 50%. The response to treatment was good. The temperature became normal after 24 hours, the oedema disappeared after 24 hours, and the proptosis of the right eye receded after a week.

Three weeks later proptosis in the left eye recurred. This was followed after four days by an area of inflammation below the inner canthus of the left eye. Another course of phenylindanedione was given for 17 days together with chlortetracycline, of which 250 mg. daily, in divided doses, was administered for three weeks. The inflammatory lesion resolved. The patient was discharged fit and well two months after admission.

Six weeks later, however, she was readmitted with a small hard swelling on the left cheek and oedema of both eyelids. She was again treated with oral phenylindanedione, 30 mg. daily for six days, followed by 20 mg. daily for six days, and chlortetracycline 250 mg. daily in divided doses, which was continued for three weeks. Progress to recovery was uneventful.

Radiological evidence of sequestrum formation could not be demonstrated at any time.

The patient was followed up for six months after her final discharge, during which time she remained well.

### COMMENT

The combination of oedema of both eyelids, bilateral proptosis, diminution of the ocular movements, engorgement of the retinal veins, and bulging of the fontanelle made it reasonable to assume that cavernous sinus thrombosis had occurred. Treatment was therefore based on this assumption.

The effectiveness of combining antibiotic and anticoagulant treatment in the majority of adult cases of cavernous sinus thrombosis is well established (Lillie, 1951; Shaw, 1952). There appears to be no previous reference to this condition in early infancy.

The case described illustrates the importance of basing the antibiotic treatment on bacteriological sensitivity tests, especially in regard to staphylococcal infections which have been acquired in hospital, where penicillin-resistant strains are likely to be encountered.

I am indebted to Dr. A. P. Norman for permission to publish this case and for help and encouragement in the preparation of this paper.

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## Agranulocytosis from Carbimazole

The initial reports on the use of carbimazole ("neomercazole"; 2-carbethoxythio-1-methylglyoxaline) in the treatment of thyrotoxicosis suggested that the drug might be free from toxicity in therapeutic dosage (Poate, 1953; Doniach, 1953). Further experience has confirmed the clinical efficacy of carbimazole but has revealed that toxic effects occur in a small percentage of treated patients. Painful or swollen joints, pyrexia, and skin eruptions have been described, but the most important complication is agranulocytosis, of which four examples have been published. As carbimazole is a relatively new drug, it is felt that the following account of a fifth case of agranulocytosis is worthy of record.

In the case of agranulocytosis reported by Fraser *et al.* (1954) the patient had previously had severe skin and joint lesions when given methimazole ("mercazole"; 2-mercapto-1-methylglyoxaline). Recovery ensued when the carbimazole was discontinued, as occurred in the two cases described by Bartels (1953) and Harrison (1954), but in that described by Richardson *et al.* (1954) carbimazole produced a complete and fatal marrow aplasia.

### CASE REPORT

A married woman aged 70 was admitted to Bromley Hospital on July 21, 1954, for the investigation of lassitude, diarrhoea, and loss of weight. Examination revealed a nodular goitre of moderate size, a fine tremor of the fingers, and moist palms. The basal metabolic rate was +30% and the sleeping pulse was persistently raised above 120 a minute. Further investigations disclosed no abnormality other than some diverticulosis of the sigmoid colon. The blood count showed a haemoglobin of 90% and a white-cell count of 3,000 per c.mm., with 1,770 neutrophils. The blood cholesterol was 170 mg. per 100 ml. The body weight was 64.5 kg.

In view of the patient's age and the moderate degree of her symptoms, it was decided to treat the thyrotoxicosis with an antithyroid drug. Carbimazole, 30 mg. daily in three divided doses, was started on July 31. After ten days of treatment there was undoubted improvement in her symptoms and signs. In particular the sleeping pulse, which had hitherto been uninfluenced by bed rest alone, fell to a normal level. She was discharged from hospital on August 16, when the dose of carbimazole was reduced to 15 mg. daily, and arrangements were made to follow her progress as an out-patient.

Fourteen days after discharge the patient sent for her practitioner, Dr. R. Colby, of West Wickham, who found her ill with a fever of 103° F. (39.4° C.). Carbimazole was discontinued, penicillin was given, and a blood count confirmed the suspected diagnosis of agranulocytosis; haemoglobin, 92%; white cells, 2,000 (neutrophils 140, lymphocytes 1,640, metamyelocytes 160, myelocytes 60). The patient was readmitted to hospital, where she ran a fever of 102° F. (38.9° C.) for the first two days. The tonsils and fauces were inflamed and the submandibular glands were enlarged. Penicillin therapy was continued, and within five days the sore throat and general condition of the patient had greatly improved and the temperature had subsided to normal. The white-cell count showed a progressive rise, and on the sixth day after admission was 5,000 (2,300 neutrophils, 1,600 metamyelocytes, lymphocytes 900, basophils 200 per c.mm.). Examination of the sternal marrow on the same day was reported to show the typical picture of the maturation arrest seen in drug reactions. The haemoglobin percentage and platelet count remained normal throughout her illness and the bleeding-time was not prolonged. She made a complete clinical recovery.

### COMMENT

The published reports on the use of carbimazole, apart from that of Bartels (1953), suggest that in therapeutic dosage it is the least toxic antithyroid agent yet available (see Fraser *et al.*, 1954). A second advantage of the drug is that the degree of thyroid gland enlargement that accompanies its use is less than with the thiouracil derivatives. In a series reported by Kirkeby and Rømcke (1955) the thyroid gland increased in size in 34% of the cases treated with methylthiouracil or propylthiouracil, compared with 7% in those treated with carbimazole. A third advantage, claimed by Poate (1953), is that the thyroid gland is less vascular after carbimazole therapy than after the thiouracil drugs.

The results of further studies on the use of carbimazole are awaited before its place in the treatment of thyrotoxicosis can finally be assessed. Meanwhile the present case report is a further reminder that the use of this relatively safe and effective antithyroid drug is not devoid of risk.

The patient was admitted under the care of Dr. N. S. Plummer, to whom I am indebted for permission to publish. I thank Dr. J. Keall and Dr. K. J. Randall for the haematological findings.

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# Reviews

## BRITISH RADIOTHERAPEUTICS

*British Practice in Radiotherapy.* Under the general editorship of Sir Ernest Rock Carling, LL.D., F.R.C.S., F.R.C.P., F.F.R., B. W. Windeyer, M.B., B.S., D.Sc., F.R.C.S., F.R.A.C.S., F.F.R., and D. W. Smithers, M.D., F.R.C.P., F.F.R. (Pp. 516+xii+33 p. index; illustrated. 85s.) London: Butterworth and Co., Ltd. 1955.

This fine volume may be accepted as presenting with full authority British practice in radiotherapy at the present time. It is a considerable achievement to have gathered in manageable compass contributions from some 60 of the acknowledged leaders in this most complex and difficult field, and its accomplishment is a tribute to the wide experience and sound judgment of the editors.

The first section is devoted to the technical problems of dosage, the action of radiation on living tissues, methods of application, and protection. An immense amount of information is compressed into a brief compass, and one must realize that the physicist, the physiologist, and the biochemist are here dealing with the limits of our knowledge in regions where knowledge is advancing every day. A full appreciation of a single page in this section might well demand years of specialized apprenticeship, but the authors have succeeded in presenting a clear account of the problems by which they are faced, of the present state of our knowledge, and of its application in their own experience.

There follow a series of monographs on treatment in various regions, by far the greater part, of course, of malignant disease. They are arranged on a uniform plan, and, considering their brevity, each gives a remarkably clear account of pathology, mode of spread, clinical features, and possible methods of treatment. The relative merits of surgery and radiotherapy are discussed and the results which may be expected are well presented. The first of these monographs is on cancer of the breast and is the work of the three editors. It is plainly the pattern on which the other articles have been built, and it is a model of clear and accurate presentation. Opening with a classification of the four clinical stages which are now generally recognized, it discusses the relative advantages of surgery and of radiotherapy and the part which each can play, with a further section on the possibilities of hormone therapy. The technical application of radiotherapy and the treatment of recurrences are clearly discussed, and tables are given of the results obtained by various systems adopted in different clinics. It is in every way an admirable monograph on a subject of vast importance.

This is a book which demands the careful study of all those who are engaged in the treatment of malignant disease or have to advise on its treatment. It supplies a record of achievement of which our country may well be proud, and it points the way to further advance. In each section a short bibliography affords easy access to the work on which its conclusions are based. We congratulate the editors on a volume which every medical man may read with advantage and which every expert will study with enthusiasm.

HENRY SOUTTAR.

## MEDICAL HELMINTHOLOGY

*Manual of Medical Helminthology.* By C. J. Hackett, M.D., F.R.C.P., with the co-operation of Professor J. J. C. Buckley, D.Sc., and the late Professor F. Murgatroyd, M.D., F.R.C.P. (Pp. 330+ix; illustrated. 18s. 6d.) London: Cassell and Company Ltd. 1954.

This short book on medical helminthology has been written by authors who have had a long experience, not only of their subject, but of teaching medical graduates preparing to take up positions in the Tropics. The reviewer has used it regularly during two terms of teaching medical officers studying for the Diploma in Tropical Medicine and Hygiene as well as for the Diploma in Public Health, and he can recommend it unreservedly, not only as a first-class guide for the use of students preparing for these diplomas, but also as an up-to-date, readable, simple, and straightforward account of a subject which is of considerable importance to practitioners in the temperate as well as the tropical zones.

R. M. GORDON.

## ENDOCRINE DISORDERS OF MENSTRUATION

*The Management of Endocrine Disorders of Menstruation and Fertility.* By Georgeanna Seegar Jones, M.D. (Pp. 198+x; illustrated. 42s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

There are so many books on this subject that it is difficult to approach a new one with enthusiasm. Yet this book quickly attracts interest, for it has something to offer which has a direct appeal to the practising gynaecologist and possibly to others. The lucid summary of present-day views on sex hormones and on pituitary–ovarian relations carries the reader far from the original simple concept of follicle-stimulating and luteinizing hormones. Perhaps even more valuable, however, is the outline of the chemistry of the hormones and of the methods and possibilities of their assay in body fluids. These are matters on which the clinician does require information, and that without the need to delve in the voluminous and abstruse endocrinological literature. The bibliography is also kept within reasonable bounds by discriminating selection.

Only one or two pages are devoted to sterility, and then only to faulty ovulation as its cause. This is in keeping with the title. The last chapter on hydatidiform mole and chorion epithelioma seems a little out of place, the only real justification for its inclusion being the diagnosis of these conditions by hormone assay. Even so, it is a helpful, if somewhat dogmatic, account of conditions about which confusion increases as knowledge advances.

The purely clinical aspects of the subject receive rather cursory treatment, and the main appeal of this small book is as a link between the laboratory endocrinologist and the clinician. As such it has much to commend it.

T. N. A. JEFFCOATE.

## CHILD PSYCHOLOGY

*The Subnormal Mind.* By Sir Cyril Burt. Third edition. (Pp. 391+xix. 20s.) London: Oxford University Press. 1955.

This book is written by a psychologist, primarily for the medical reader, with the aim of describing the various psychological problems encountered in children and of discussing their causes, diagnosis, and practical treatment. Starting with a chapter on normal children, the author proceeds to describe the differing degrees and kinds of psychological deviation from the normal, under the headings of the neurotic, the delinquent, and the intellectually and educationally retarded child. The complex relationships between the physical, the psychological, and the social factors which cause these problems are most skilfully discussed.

In the present edition many valuable footnotes have been added which bring the book more up to date and make it outstandingly comprehensive. It is written with great clarity, and although no reader will have difficulty in understanding what this psychologist is trying to say the reviewer finds some of the terminology, and the underlying concepts, rather different from those in common contemporary use. The title "The Subnormal Mind" is an example of this. It would indeed be regrettable if this book were to be ignored by some of those who seek to understand psychological problems in children, on account of a title which suggests that it deals mainly with "mental defectives." The major part of the book is in fact concerned with neurotic children, and is a masterly exposition, based on considerable empirical study of psychological problems that are encountered almost daily in the surgery and the school.

The sections on treatment deal mostly with common-sense, practical types of treatment such as advice, reassurance, and simple environmental changes. The book does not attempt to describe in detail the more specialized methods used in child-guidance clinics, but provides numerous case descriptions which aid the physician in recognizing those signs of severe psychological abnormality that call for expert diagnosis and treatment.

L. GARDNER.

## ACUTE POLIOMYELITIS

*Diagnosis and Treatment of the Acute Phase of Poliomyelitis and its Complications.* Edited by Albert G. Bower. (Pp. 257; illustrated. 50s.) London: Baillière, Tindall and Cox, Ltd. 1955.

Written by a team of specialists from the Los Angeles County Hospital, and based on a total of 17,000 cases, this is a most instructive and important book. The main emphasis is naturally on the problems of respiratory difficulty in poliomyelitis, and the analysis of all aspects of these problems is presented in considerable detail. The difficulties and pitfalls of diagnosis are discussed at length, and for most workers in Britain this is perhaps the most important part of the work. The perplexing problems which arise in treatment—anoxia, hypercapnia, over- and under-ventilation—are all tackled. The chapter on biochemical and electrolyte changes is most instructive and helpful, presenting material difficult to find elsewhere. Mechanical appliances are discussed in some detail and the various methods of treatment surveyed: the reader may disagree with some of the views in this section, but the basis of treatment of respiratory poliomyelitis must be an appreciation of the complicated physiological, pathological, and mechanical factors. The authors of this book discuss these essential factors in a practical and stimulating manner. It can be highly recommended to all who have a part to play in the treatment of acute poliomyelitis.

A. B. CHRISTIE.

## SURGICAL NURSING

*The Principles and Practice of Surgical Nursing.* By D. F. Ellison Nash, F.R.C.S. (Pp. 1,007+vii; illustrated. 30s.) London: Edward Arnold Ltd. 1955.

It is difficult to keep up to date with an advancing science. Textbooks, even those with frequent new editions, have difficulty in smoothly incorporating new knowledge and maintaining a true balance. There comes a time when a new statement of principles is required, made by one whose training and experience belong more to the new than the old knowledge.

In his introduction Mr. Nash states: "Scientific discovery during the last ten years has so advanced the control of disease that nursing methods have, in certain aspects, changed almost beyond recognition." He has therefore attempted to make, and in our opinion has admirably succeeded in making, a new statement of the principles of surgery and of the techniques which the surgeon has called to his aid. In a thousand pages, divided up into 10 sections and 48 chapters, he surveys every branch of surgery, showing the relative parts played by the surgeon and the nurse in every department. In a book of this size we purposely refrain from petty criticism of minor slips, because we believe the teaching is fundamentally sound and much needed at the present juncture.

For whom is this book written? The title implies that it is written for nurses. We agree that it contains all that a nurse is ever likely to need in her nursing of surgical patients, but we are sure that it deserves a wider circulation. Medical students and general practitioners who read this book will obtain a bird's-eye (and even a closer) view of all the modern advances in surgical techniques, and they will be none the worse for reading the sections in which nursing duties are explained. The price of this encyclopaedic book—30s.—is astonishingly low.

ZACHARY COPE.

## CLASSIFICATION OF TUBERCULOSIS

*Tuberculosis: Classification, Pathogenesis and Management.* By Milosh Sekulich, M.D. Edited by H. Stanley Banks, M.D., F.R.C.P. (Pp. 316+xiii; illustrated. 50s.) London: William Heinemann Ltd. 1955.

The classification of tuberculosis has exercised the ingenuity of workers in this field for more than fifty years. As a result many schemes have been evolved, most of which express the theoretical views of their authors as well as factual data. Dr. Sekulich's classification starts at a disadvantage because its description fills a book which is both long and expensive. Much industry and careful thought have been devoted to this work, but it is too discursive and lacks originality, although the author may have reached his conclusions independently. For example, he divides tuberculosis into two types, primary and secondary, and claims that this is a revolutionary step. But the literature shows that a similar division has formed the basis of most previous classifications, and it is perhaps significant that in this book of 300-odd pages only 7 are devoted to the history of the subject.

The reviewer sympathizes with Dr. Sekulich in his desire to introduce a qualitative assessment into the classification of tuberculous lesions. Most workers, in fact, have personal schemes for classifying their cases in such a way, and the neat index cards illustrated in this book must have their counterparts in many sanatoria and chest clinics. Yet such schemes are essentially a part of the individual who creates them and their value is chiefly to him and to his co-workers. When published, they often appear needlessly complex, and the qualitative approach inevitably introduces an element of controversy. They have little chance of being universally accepted as alternatives to the classifications now in general use, such as those advocated by the Ministry of Health in this country and the National Tuberculosis Association in America. These may be imperfect, but they are simple and objective; they fulfil the most important functions of a tuberculosis classification by providing a stable terminology and an agreed basis for the comparison of work from different sources.

Elaborate individual classifications of tuberculosis, often full of interest and ingenuity, have appeared with unfailing regularity over the years, but they have as surely been forgotten. It seems unlikely that this book will prove to be an exception.

A. F. FOSTER-CARTER.

## EFFECTS OF COLD

*Man in a Cold Environment: Physiological and Pathological Effects of Exposure to Low Temperatures.* By Alan C. Burton, Ph.D., and Otto G. Edholm, M.B. (Pp. 273+xiv; illustrated. 30s.) London: Edward Arnold Ltd. 1955.

This is a book which all those interested in environmental physiology have been awaiting for some time. It brings together knowledge from many scientific disciplines, covering as it does such widely separated subjects as climate and civilization, textile physics, comparative physiology, hypothermia, and cold injury. The early chapters are devoted to thermodynamic principles and to the measurement of the heat exchanges of the body with its environment. The mathematical treatment is clear and concise, and simplified mathematical forms have been used to avoid the calculus.

There is a fascinating description of recent work on adaptation to extreme cold in animals such as the seal and arctic fox, and on the hibernants. Much valuable information on cold-weather protective clothing which has previously appeared only in Service reports has been rescued from oblivion in departmental files. The chapters on hypothermia, body temperature, and the circulatory responses to cold will be valuable to the medical student and physician. The controversial question of the mechanism of cold injury and the treatment of frostbite is clearly presented. The text is greatly helped throughout by excellent charts and diagrams and is well documented.

G. PUGH.

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## INTERNATIONAL NUTRITION

The recent death of Sir Edward Mellanby is a reminder of the part played by Britain in the early phase of the growth of nutrition as a subject in international medicine. Mellanby was chairman of three international conferences for standardization of vitamins and of the International Technical Commission on Nutrition, and it has been remarked that, while the atmosphere of Geneva in the 1930s was not always stimulating,

"this was not evident in the work on nutrition, thanks largely to the energy and determination of the experts who represented Britain. By common consent whatever success was achieved was due in no small measure to Mellanby's patience, assiduity, and ability to reconcile different viewpoints."[1]

Lord Boyd-Orr was the first director-general of the Food and Agriculture Organization, and a standing advisory committee on nutrition was formed. This was succeeded by a joint expert committee on nutrition of the Food and Agriculture Organization with the World Health Organization, the first meeting of which was held in 1949 under the chairmanship of Lord Horder. Other British workers in nutrition have contributed to the growth of the subject in the international field. Dr. W. R. Aykroyd has been director of the nutrition division of F.A.O. for the past ten years, and the first head of the nutrition section of W.H.O. was Dr. F. W. Clements, who was chairman at the third meeting of the joint F.A.O.–W.H.O. expert committee on nutrition in 1952. The present head of the section is Dr. R. C. Burgess. The report of the fourth meeting of the expert committee, which was held at Geneva in October, 1954, under the chairmanship of Professor B. S. Platt, is awaiting publication. In addition to these main conferences the regional nutrition committees have met under the sponsorship of the two international organizations.

Nutrition problems in Africa south of the Sahara fall at present within the province of the Commission for Technical Co-operation in Africa South of the Sahara (C.C.T.A.), and under its auspices two conferences have been held. The first, at Dschang, Cameroons, in 1949, was a general discussion of problems. The second, in 1953 at Fajara in the Gambia, differed from the pattern of the other meetings in that a single topic believed to be of paramount importance was chosen for discussion—malnutrition in mothers, infants, and young children. The choice of this subject was the precedent for three more conferences in 1953,[2] when it was again considered in whole or in part. The report[3] of the C.C.T.A. conference at Fajara contains much information not available elsewhere and hitherto unpublished. It is the first substantial contribution to the subject of protein malnutrition, which is receiving increasing recognition and in some of its aspects will be familiar to those workers who have followed the recently developed interest in the disease known in Africa as kwashiorkor. Members of the joint F.A.O.–W.H.O. expert committee on nutrition which met in the Gambia immediately afterwards made contributions as observers to the C.C.T.A. conference. These contributions made clear that Frontali[3] has since 1925 in Italy recognized in "starchy food dystrophy" a disease which is closely similar to that known for forty years in some parts of Europe as mehlnährschaden. In a recent text on kwashiorkor[4] the authors are evidently impressed with the similarity between mehlnährschaden and kwashiorkor, though they are reluctant to commit themselves in terminology to the disease's being a form of protein malnutrition.

One recommendation of the C.C.T.A. conference was that at the next conference practical means of improving indigenous food supplies should be studied, with a view to reducing or eliminating protein malnutrition in the vulnerable groups. The report (awaiting publication) of the fourth session of the joint F.A.O.–W.H.O. expert committee on nutrition gives some consideration to practical ways in which the two U.N. organizations can help development of foods satisfactory for infant and child feeding, and notably for increasing supplies of protein-rich foods for pregnant and nursing mothers. It is perhaps belatedly recognized (and sometimes even overlooked) that breast-feeding by an adequately fed mother gives an ample diet to supply the basic nutritional needs of the young infant. The report includes a review of the recent work of F.A.O. and W.H.O. and a discussion of their programmes, a feature of which is the growth of co-ordination between the two organizations; it has been specially evident in the work on protein malnutrition. The committee proposes to start in 1955 a study of anaemias, and, when

[1] *British Medical Journal*, February 5, p. 355.
[2] The third meeting of the Regional Nutrition Committee for South and East Asia, the third conference on nutrition problems in Latin America, and a symposium on protein malnutrition held in Jamaica.
[3] *Rep. 2nd inter-Afr. Conf. Nutr. Gambia, 1952*, 1954, London, H.M.S.O. See *British Medical Journal*, February 5, p. 342.
[4] Trowell, H. C., Davies, J. N. P., and Dean, R. F. A., *Kwashiorkor*, 1954, London.

the opportunity offers, to investigate nutritional disorders of the eye and the relationship between nutrition and parasitism.

A subject which had previously received little more than passing mention in this committee was fully considered—namely, the effects on nutrition of the intentional incorporation of additives in food. The committee recommended that the directors-general of F.A.O. and W.H.O. should consider means by which international consultation could be achieved, and indicated the desirability of setting up an expert committee for the purpose of determining general principles for the use of food additives. The committee recommended that W.H.O. should continue to encourage governments to introduce iodized salt for the prevention of endemic goitre, newly developed methods of iodization being used; at the same time, they should continue to assess the efficacy of the measure. Although scientific data on pellagra were not sufficiently conclusive for the committee to be so definite about the steps to be taken to reduce or eliminate this disease, it considered that governments of countries concerned should be encouraged to undertake pilot programmes for its control. New information is available about human energy requirements, and it was recommended that a successor to the committee on calorie requirements be convened to review accumulated facts and experience and prepare a revised report. It was also considered that there should be a meeting of an expert group on protein requirements, having priority over the committee on calorie requirements, since a statement on protein requirements is urgently needed.

The committee clearly felt that its earlier exhortations to include training in nutrition for medical students and public health officers had not reached, or at all events affected, the efforts of those who controlled medical education in different countries, and it was agreed that renewed efforts should be made to secure action in the interests of the well-being of the public. The report includes an appendix on methods and content of education in nutrition, and a recommendation that efforts should be made to convey to those likely to benefit by improvements in nutrition the knowledge of how to do so through better use of their local resources. These efforts should be considered in relation to the technical assistance programme of completed or planned projects which are listed in an appendix to the report.

There is a tendency to associate problems of malnutrition in the world with those parts which are known as "underdeveloped." However, subjects of the report such as additives to foods, endemic goitre, calorie and protein requirements, and nutrition education apply equally to the wealthier countries. A special problem of countries with abundant food supplies is that of over-feeding, and the committee, noting that malnutrition may result from excessive consumption of food as well as from nutritional deficiencies, considered that there should now be a systematic study of the relationship between nutrition and certain degenerative diseases, especially atherosclerosis and related degenerative heart diseases. In short, action taken in the past decade gives grounds for satisfaction with achievements in the field of nutrition, especially in those countries where undernourishment is particularly prevalent.

## HIATUS HERNIA

Oesophageal hiatus hernia has been thoroughly understood only in recent years, owing largely to the work of S. W. Harrington in America and P. R. Allison in Britain. That these two should be responsible for this progress is appropriate, for the hiatus is a chink in the wall which divides the territories of the general from the thoracic surgeon, and the affliction has been dubbed[1] the "hole in the iron curtain."

Middle-aged and overweight women are most susceptible to the complaint, which suggests that fatty infiltration of the fascia in the region of the diaphragmatic crura may be a cause coupled with a rise of intra-abdominal pressure due to compensatory "foundation" garments or, in younger women, to pregnancy.[2] But some hernias are congenital, and they have no preference for the old, fat, or feminine. Two types of hiatus hernia are recognized. In the first type the fundus of the stomach and occasionally other viscera slip through the opening in the right crus beside the oesophagus, while the oesophago-gastric junction remains in its normal place. In this, the para-oesophageal, variety strangulation may rarely occur; as a rule the hernia causes only mild dyspeptic symptoms. A gastric ulcer sometimes develops in the thoracic part of the stomach; occasionally the whole stomach enters the chest and becomes a volvulus by axial rotation. The second type of hiatus hernia differs from all other varieties of hernia in that it does not give trouble by obstructing or undergoing strangulation but makes its presence known by destroying the competence of the cardiac orifice of the stomach. The oesophago-gastric junction slides through the hiatus together with a variable quantity of stomach and peritoneum. It is known as the sliding

[1] Ogilvie, Sir Heneage, *Surgery*, 1955, **37**, 272.
[2] Gordon, D. F. P., *J. Obstet. Gynaec. Brit. Emp.*, 1955, **62**, 259.
[3] Marchand, P., *Brit. J. Surg.*, 1955, **42**, 504.
[4] Allison, P. R., *Surg. Gynec. Obstet.*, 1951, **92**, 419.
[5] Harrington, S. W., ibid., 1955, **100**, 277.
[6] Wells, C., and Johnston, J. H., *Lancet*, 1955, **1**, 937.

hernia, and in passing through the hiatus the junction of the two viscera loses the angulation previously maintained by the right crus. P. Marchand[3] has recently made a thoughtful contribution to the subject in an essay on gastro-oesophageal regurgitation. He points out that the pressure within the abdomen is normally 10 to 15 cm. of water higher than that in the thorax, and under certain conditions—for instance, during pregnancy—it is much higher. The mechanism of the cardiac orifice is constantly at work overcoming this pressure gradient. Marchand has shown that the most important feature of this mechanism is the angle of junction of the oesophagus with the stomach, though the contraction of the gut muscle itself plays a small part. It is unlikely that the diaphragmatic muscle takes part in this mechanism, for there is no reflux in cases of para-oesophageal hernia despite the laxity of the hiatus.

It has been shown experimentally that the oesophageal mucosa is much the most sensitive of all the alimentary mucosae to the action of peptic juice. If reflux of gastric juice into the oesophagus occurs, oesophagitis is an inevitable consequence; it is but the beginning of further pathological changes. Oesophagitis causes pain, which is experienced substernally and is maximal when the lower oesophagus is stimulated by the presence of food or when the peptic juice regurgitates during recumbency or stooping. It may radiate widely and may even be experienced in the lower jaw. More severe consequences of oesophagitis may ensue, such as ulceration with the risk of haemorrhage, and finally stricture may occur, which is the most difficult complication to deal with.

The diagnosis is not difficult to establish in the patient with a sliding hernia and oesophagitis. The dyspepsia of para-oesophageal hernia must be distinguished from that of gastric ulcer and cholelithiasis; the three are not uncommonly associated. In addition to the routine radiological investigation of the upper alimentary tract, oesophagoscopy is essential for diagnosis. By its means oesophagitis is revealed, as well as the level of the change from oesophageal to gastric mucosa.

Hiatus hernia may be present in all degrees of severity. In a mild case, in which oesophagitis is slight, a conservative regime will enable the patient to remain free of symptoms. She is advised to lose several stones in weight and to discard her corsets; at night she should raise her shoulders with pillows to prevent gravitational reflux. The presence of severe oesophagitis or the onset of one of the complications makes operation mandatory. The operation usually carried out is designed to restore the normal anatomy and to re-establish the mechanism of oesophago-gastric competence. Allison[4] has emphasized the most important step, which is to fix the oesophagus below the hiatus by suturing the oesophago-phrenic fascia to the under surface of the diaphragm. The two limbs of the right crus are then lightly opposed by a few sutures. Restoration of the obliquity to the oesophago-gastric junction prevents further reflux of gastric juice. This operation may be performed through a thoracic incision or by laparotomy; most surgeons would agree that the thoracic approach is easier and allows more careful dissection of the fascia propria of the oesophagus.

The recurrence rate following this operation is a subject of debate at present. Harrington[5] reports a 3% recurrence rate, but C. Wells and J. H. Johnston[6] state that this type of operation has been so disappointing that they have given it up. They adopt another operative plan—that of accepting the presence of the hiatus hernia but attempting to abolish the peptic acidity by gastrectomy coupled with vagotomy. In order to avoid bilious reflux they perform a Roux loop anastomosis and rely on the vagotomy to prevent ulceration in the loop. This operation is a much more severe procedure than simple hernial repair and its use can be justified only if the simpler operation is inadequate. The treatment of stricture is difficult, but recently resection with replacement by an isolated jejunal loop has been tried. This is another extensive operation which should be reserved for severe cases.

Hiatus hernia is an interesting condition embryologically, mechanically, and clinically. It may present as dyspepsia, dysphagia, anaemia, or severe haemorrhage. Its early recognition is desirable, because in most cases treatment gives gratifying results.

## CLASSIFICATION OF EPILEPSY

The best method of classifying epileptic attacks has long been disputed. Although the development of electroencephalography and the correlation of the type of electrical disturbance with the clinical phenomena of the attack has added to knowledge of epilepsy, it has brought problems of its own, especially in the field of terminology. Recently Sir Charles Symonds discussed the problem in this *Journal*,[1] and he emphasized the value of considering five separate facets of an epileptic seizure: first, the clinical events of the seizure, both subjective and objective; secondly, the anatomical area in the brain in which the epileptic discharge starts, even though the attack later becomes generalized; thirdly, the physiological phenomena which accompany the seizure (and in effect this means the type of E.E.G. disturbance); fourthly, the underlying pathology; and fifthly the response to various drugs. To these he might have added, as he did in a previous

paper on the subject,[2] the biochemical aspects, for it is recognized that such disturbances as hyperinsulinism and alkalosis can precipitate epileptic attacks. Symonds then divides epileptic attacks into two major groups based on the type of E.E.G. discharge—first, those in which there is a bilateral synchronous symmetrical discharge, and secondly those in which the initial electrical disturbance is in some specific area of the brain.

This classification depends on the electrical disturbance which occurs during a clinical attack. Records taken between attacks may either be normal or show non-specific abnormalities, though at times subclinical attacks may be recorded, especially when various activating techniques are employed. The type of attack which is accompanied by a symmetrical discharge may be a major convulsion with loss of consciousness from the onset and without any premonitory symptoms, or transient impairment of consciousness, or myoclonic jerks without impairment of consciousness. Traditionally the term petit mal has been used to denote any epileptic seizure of brief duration with impairment of consciousness and without convulsive movements, but many observers now think that the term should be confined to the attacks with these clinical characteristics and accompanied by a bilateral symmetrical spike-and-wave discharge in the E.E.G., while the brief epileptic seizures without these E.E.G. characteristics should be given some other name: Symonds suggests "minimal seizures." There is practical value in this differentiation, since petit mal with these E.E.G. changes often responds to treatment with troxidone, which is relatively ineffective in other types of epilepsy. Moreover, it is essentially a disorder of childhood, tending to stop after puberty, though sometimes being replaced by major epilepsy, while other types of brief epileptic attack may first appear in adult life. Some experimental evidence suggests that epilepsy with a bilateral synchronous symmetrical E.E.G. discharge arises in the central grey matter of the brain rather than in the cerebral cortex, and the term "central epilepsy" has been used as a generic name for it. This name perhaps implies rather more than is yet known about the site of origin, but probably most cases of idiopathic epilepsy fall into this group.

In other forms of epilepsy the initial discharge arises in some particular area of the brain, and in many cases the premonitory subjective symptoms and the early objective phenomena of the seizure will clearly indicate where this focus is. Often this clinical localization will be confirmed by E.E.G. studies, while in some cases E.E.G. recordings may be the only means of establishing the initial focus of discharge; in others, again, the E.E.G. may not serve to locate the lesion. This type of epilepsy is usually called focal, but Symonds prefers the term "partial epilepsy," which was introduced by Gastaut.[3] This term seems a bad one; the dictionary gives several meanings of the word "partial," but it is commonly used as a synonym for "incomplete," which is an inappropriate description of many focal epileptic attacks, for they may end with generalized convulsions when the epileptic discharge spreads throughout the brain. The chief objection to the use of the term "focal epilepsy" appears to be the suggestion that attacks may start in areas of the brain other than the cerebral cortex, but a cortical origin is not implied in the term, and it seems an inadequate reason for rejecting a name indicating a local origin of the epileptic discharge and substituting one implying that the attacks may not become generalized.

It is to be noted that Symonds has not mentioned the traditional term, Jacksonian epilepsy, in his classification, and this may well be because, as he pointed out in a previous paper,[4] this term has been used in different senses in the past. It should imply a focal fit in which there is a motor or sensory march of cortical involvement, but it has at times been wrongly used as a synonym for post-traumatic epilepsy. The reason for this misuse of the term appears to be that Hughlings Jackson, when discussing the cortical origin of focal motor fits, described a patient who had a traumatic [illegible]ical scar. Knowledge of the possible pathological [illegible]s for focal epilepsy has increased in recent years, particularly as the result of Penfield's work in Canada and the study of patients with temporal lobe epilepsy who have been treated by temporal lobectomy.[5] It seems probable that most patients with focal attacks have a focal pathological lesion, though this may often be of a microscopic and non-progressive nature. In many of these cases the epilepsy may be readily controlled by regular and adequate anticonvulsant treatment.

[2] Symonds, Sir Charles, *British Medical Journal*, 1955, **1**, 1235.
[3] —— *Arch. Neurol. Psychiat. (Chicago)*, 1954, **72**, 631.
[3] Gastaut, H., *The Epilepsies*, 1954, Oxford.
[4] Symonds, Sir Charles, *British Medical Journal*, 1948, **1**, 533.
[5] See *British Medical Journal*, 1954, **2**, 973.

## SAFER ANAESTHETIC EQUIPMENT

A new safety device to prevent administration of the wrong anaesthetic gas was demonstrated by the British Standards Institution last week. It is a non-interchangeable valve for gas cylinders and anaesthetic apparatus. In 1946 the Institution issued as a code of practice a British Standard for medical gas cylinders and other instruments used for anaesthetic administration. This was done in response to a joint request submitted by the Medical Defence Union and the Association of Anaesthetists of Great Britain and Ireland, and representatives of those bodies, including Dr. Robert Forbes, Dr. Roche Lynch, and other medical men, have since been serving on a British Standards committee with representatives of Government departments and manufacturers' associations in the endeavour to perfect and bring into international use a safe and foolproof system. The principle adopted in the non-interchangeable valve is similar to that used with wireless valves, whereby spacing of the pins ensures that each type can be inserted only in the corresponding socket. Differently spaced pairs of holes in the valves register with corresponding pins in the connecting part of the administration apparatus, so that only the right cylinder can be connected to the right yoke. Thus it will be impossible, for example, to connect a cylinder of nitrous oxide to the administration equipment for oxygen.

An equivalent standard is already in operation in the United States and Canada, and it is also widely used in Australia and Switzerland. It is hoped that it will be adopted by all N.A.T.O. countries, leading to closer co-ordination between the medical services of their armed forces. A week or two ago in Stockholm the system was accepted as a draft recommendation by the technical committee of the International Organization for Standardization. The new equipment of the pin-index type will be available in Britain this autumn, and manufacturers of gases have enough new cylinders to meet demands. The task of converting the large number of existing anaesthetic machines and cylinders cannot be started until the autumn of next year, for new tools and trained staff are needed. The conversion is being planned on a regional basis; the first machines to be converted will be those in hospitals, and the equipment used by doctors outside, midwives, and dentists will come next.

The cost of converting cylinders will be borne by the manufacturers of the gases, but the cost of converting apparatus to fit the new type of cylinder valves will be the responsibility of the owners of the equipment, which in some cases may be so old that complete replacement would be advisable. The new system applies only to cylinders having a capacity of 24 cubic ft. (0.67 cubic m.) or less. Large cylinders are already equipped with valves which make the wrong connexion impossible. Since pipeline supply systems, such as are used in many hospitals, are fed from the larger cylinders, no question of changing valves or fittings arises.

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## FOOD-POISONING FROM MEAT PIES

The description of a widespread outbreak of salmonella food-poisoning and the results of experiments which have contributed knowledge of importance in the manufacture of meat pies are the subject of a report[1] published this week by the Ministry of Health. The same subject served also as the text of a paper delivered by Dr. A. A. Miller at the international symposium on food-poisoning held by the Society for Applied Bacteriology at Cambridge (see p. 258). This explosive outbreak occurred in June, 1953, and lasted seven days. It was large and severe, extending from Lancaster in the north to Wigan in the south. The number of persons affected was 1,149: they were of all ages, and the five who died were between 16 and 72 years. The infected food proved to be meat pies from one bakery, and the causative organism was *Salmonella bovis morbificans*, which is relatively uncommon in England and Wales. Twenty-four of the 34 pies examined were heavily contaminated with this organism, and 563 positive faeces samples were obtained from 1,123 patients. Most of the patients were bacteriologically clear by the fourth week, but five were still carrying the organism after fifteen weeks in spite of treatment with chloramphenicol, streptomycin, and sulphonamides. Fewer than 70% of the patients showed evidence of agglutinin production. The incidence of secondary cases was low and the illnesses of these patients were relatively mild.

The source of infection was not found among the bakery staff, and an examination of the common constituents of the pies—such as gelatin, flour, fat, and egg wash—and of working surfaces, utensils, and refrigerator shelves proved to be negative. It was therefore thought that the meat was the probable source of infection. The supplies of meat received by the bakery at the relevant time included meat from carcasses of several animals sent for casualty slaughter; a particular herd from which some of this meat was derived was investigated serologically, and there was slight but very inconclusive evidence that the herd might have been infected with *Salm. bovis morbificans*.

The meat used in the manufacture of the pies was allowed to stand at room temperature overnight. The next morning the raw meat was minced and fed into hoppers which deposited a fixed amount into each pie-case, the lids being placed on by hand and pressed down mechanically. After baking, the pies were cooled in open trays at bakehouse temperature for up to four hours, when a warm solution of gelatin was poured through the perforated lid. They were sent out for distribution the next day. It was plain to those investigating the outbreak that this procedure would encourage the multiplication of those organisms which either survived the baking process or were introduced with the warm gelatin. Experiments were designed to test both these possibilities, using the bakery oven in which the infected pies had been cooked and a laboratory sterilizing oven. Cultures of *Salm. bovis morbificans* were inoculated into the meat or the dough of pies, and these were examined after baking for different times and at different temperatures. Results showed that heating at 380° F. (193° C.) for forty minutes of 4-oz. (113-g.) pies and for thirty-two minutes of 2-oz. (56-g.) pies, as was nominally the practice in the bakery, was enough to destroy salmonella organisms in the centre of the pies. With lower temperatures it was found that 320° F. (160° C.) for sixty minutes was effective, but 320° F. for thirty minutes allowed the survival of many organisms. But during the day-to-day baking of pies there were marked fluctuations in temperature due to rates of loading, quantities put in the oven, and the opening of the oven to remove food requiring a shorter cooking time. The variations in temperature recorded during routine baking showed that contaminating organisms in the meat could have survived the baking process. Furthermore, although in most bakeries there is a set time and temperature for the baking of pies, the time is often varied by the baker according to the differences in oven temperature, moisture content, and so on, the object being to produce a pie of pleasing appearance.

Further experiments were carried out to show the effect of baking on the destruction of *Salmonella typhimurium* and *Salm. bovis morbificans* when mixed cultures of various ages of both organisms were inoculated

[1] Miller, A. A., Nicol, C. G. M., and Ramsden, F., "An outbreak of food poisoning due to *Salmonella bovis morbificans* (Basenau) in which the vehicle of infection was meat pies." *Rep. publ. Hlth med. Subj.*, No. 96, 1955, Ministry of Health, London. Price 2s. 6d. net from H.M.S.O., London.

separately into the meat. Results showed that with the particular strains used *Salm. bovis morbificans* was more resistant to heat than *Salm. typhi-murium*.

Other experiments were designed to find out whether the pies might have been contaminated, after baking, when the gelatin was introduced or when the pastry lids were put on. When contaminated water was splashed into hot bowls of gelatin, or workers with contaminated fingers and thumbs touched the pies, organisms could be recovered from all the pies, the extent of contamination depending on the period and temperature of post-baking storage. These experiments were inspired by a second outbreak of food-poisoning in the same area traced to meat pies contaminated with *Salm. typhi-murium*. At the bakery concerned an open container of warm gelatin was found approximately 3 ft. (90 cm.) from a well-used wash-basin, and furthermore the baker who prepared the gelatin solution which was poured into the cooling pies after baking was a symptomless excreter of *Salm. typhi-murium*.

In his preface to the report Sir John Charles points out that the traditional methods of baking provide only a small margin of safety and that slight departure from normal baking times and temperatures may allow survival of pathogenic contaminants likely to multiply later. Several outbreaks of food-poisoning due to contaminated meat pies have been reported, and it seems likely that the mode of contamination and survival of the infecting organism must often have occurred in the way described by Dr. Miller and his colleagues. The bakery tests were carried out with full co-operation of the bakers concerned, and once again the results show the value of field work in the investigation and control of food-poisoning. The report has a useful technical appendix which includes recommendations designed to safeguard the public against the risk of meat pies being contaminated during manufacture or of being insufficiently cooked to destroy pathogenic bacteria. Meat pies may not be everyone's idea of an appetizing snack, but they are a very popular and comparatively cheap article of food. The incidence of salmonella food-poisoning is rising yearly, and no time should be lost in putting into practice methods of prevention known to be effective.

## NEW STEROID ANAESTHETIC

In 1941 H. Selye[1] showed that certain steroids produced anaesthesia in rats and fish. Among the most potent agents were desoxycorticosterone, progesterone, and pregnanediol, the hormonally inert metabolite of progesterone. Further research on the inhibitory effect of these steroids on oxygen uptake *in vitro* showed that the site of action appeared to be at the dehydrogenase level rather than on the cytochromes.[2] Recently G. D. Laubach, S. Y. P'an, and H. Rudel[3] have found that the steroid 21-hydroxypregnanedione is an effective anaesthetic agent which is devoid of hormonal activity. The water-soluble sodium salt of the steroid hemi-succinate ester has been given the name "viadril." The therapeutic index of viadril has been determined by animal experiment to be two to three times as great as that of thiopentone, and it is claimed, therefore, that the new drug will have a wider margin of safety. Neither liver damage nor bilateral nephrectomy affected the anaesthetic activity of this agent, and the duration of anaesthesia remained practically unchanged.

At a meeting of the International College of Surgeons this year at Geneva F. J. Murphy, N. P. Guardagni, and F. L. Debon reported a series of 125 patients in which viadril was given as an anaesthetic for the performance of some twenty different surgical procedures. It was administered as a basal anaesthetic, preceded by conventional premedication and supplemented by nitrous oxide and oxygen in the proportions of 3:1. Pethidine and relaxants were given during the anaesthesia according to the accepted indications. The drug is administered in the form of a 2½% solution, which is injected into the tubing of an intravenous drip at a point some distance from the arm so as to permit of dilution. Higher concentrations of viadril cause irritation, perceptible by the patient as pain along the course of the recipient vein; a few cases of thrombophlebitis have been reported. Induction is slow, the usual dose of 1 to 1½ g. of viadril being given over a period of five minutes, an additional five minutes being allowed before any further manipulation. After one hour of anaesthesia continued with nitrous oxide, recovery was said to be prompt. A transitory fall in blood pressure was often observed, and could be counteracted by pressor agents. In the dosage given apnoea was not seen, but there was evidence of some respiratory depression, and controlled respiration could readily be instituted.

Despite the fundamental chemical and pharmacological differences between the two agents, anaesthetists will compare these clinical reports of viadril with their own experiences of thiopentone. It is claimed that viadril is a more efficient and complete anaesthetic than thiopentone, and in particular that anaesthesia is accompanied by less marked respiratory depression. However, the addition of a relaxant appears to be necessary for intra-abdominal procedures, though a lower dose than usual is said to be required. Hypotension and venous irritation are disadvantages common to the two agents. Many anaesthetists hope to see the development of new anaesthetics which act promptly and from which recovery is very quick, thus affording better control; viadril does not appear to fulfil this hope. Further elucidation of the pharmacology and reports of more extensive clinical trial (with electrocardiographic and electroencephalographic observations) are awaited with keen interest.

Sir Harry Platt was re-elected President of the Royal College of Surgeons of England on July 14. The two Vice-Presidents are Mr. Julian Taylor and Mr. R. P. Scott Mason.

[1] Selye, H., *Proc. Soc. exp. Biol. (N.Y.)*, 1941, **46**, 116
[2] Hochster, R. M., and Quastel, J. H., *Ann. N.Y. Acad. Sci.*, 1951, **54**, 626.
[3] Laubach, G. D., *et al.*, *Science* (in press).

# EMERGENCIES IN GENERAL PRACTICE

## BACILLARY DYSENTERY

BY

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The classical description of bacillary dysentery which is still enshrined in many medical textbooks depicts an acute illness usually of sudden onset in which the dominant feature is frequent and painful diarrhoea. The stools contain or may consist solely of blood and mucus. Fever and abdominal pain are characteristic and a more or less severe prostration is common, so that the reader gains the impression that the disease is a severe one. So far as Great Britain is concerned such a picture is no longer true, and, although the actual proportion of cases which merit this description may vary from place to place, and from time to time, it must now represent a small minority, and in many patients none of these classical signs is present. Nevertheless bacillary dysentery still has emergency aspects in that outbreaks may disrupt the running of institutions, the infection if undetected in food-handlers may lead to explosive outbreaks, and debilitated infants and old people are likely to be seriously ill if infected.

### Aetiology and Clinical Course

The infecting agent most commonly encountered in Britain is *Shigella sonnei*, which generally produces a mild illness, so mild indeed that many individuals never seek medical advice. The epidemiological picture is further complicated by the fact that many persons excrete the bacillus without suffering any clinical illness. The remainder of the infections are produced by one or other of the Flexner types, and with these, too, the resulting illness is usually mild. The more dangerous *Shigella dysenteriae* (Shiga's bacillus) is rarely encountered here, though localized outbreaks have been recorded.

The incubation period is two to three days. In a few patients nausea, slight fever, and abdominal discomfort may be experienced for 12 hours or more before the onset of diarrhoea, and in adults the diarrhoea may gradually increase in frequency during the first two days. The onset in children is more often abrupt and may be accompanied by spasms of abdominal colic and generalized lower abdominal discomfort. Loose motions may persist for a week, but a frequency of more than two or three stools a day seldom occurs after the first 48 hours. Actual diarrhoea indeed is not invariable and, particularly in young children, the only unusual occurrence may be the passage of one or two green loose stools without any evidence of blood or mucus. Blood is, in fact, observed in the stools of only about one-third of the cases, and even in those its appearance is often on one occasion only. The usual complaints, therefore, are of a mild character, and it is unusual to find any evidence of a systemic upset. For example, in a recent survey of 200 patients admitted to hospital only four could be regarded as really ill.

The recovery of the patient is equally rapid even when specific treatment is not given; unfortunately he may continue to excrete pathogens for a long time. Complications are rarely seen. However, when dysentery is encountered among severely debilitated infants, or in the aged, a wide variety of complications have been described, but these are more an index of the primary debility than true complications of the dysenteric infection.

### Differential Diagnosis

When it is known that dysentery is prevalent or an epidemic occurs in a closed community, a presumptive diagnosis may be made with reasonable accuracy. Nevertheless, it is undoubtedly true that unless specimens are submitted for bacteriological examination the condition will often be missed. Rectal swabs of specimens of faeces, once taken, should be transmitted to the laboratory as quickly as possible. It is worth remembering that a few doses of a sulphonamide will not eliminate the bacilli from the bowel; therefore specimens may still be sent after treatment with these drugs has begun. In the mild type of dysentery now prevalent the classical bacillary exudate is absent and no information of value is obtained by microscopical examination.

Dysentery is, of course, in effect a form of food infection. Only by bacteriological examination will it be possible in many cases to distinguish it accurately from other forms of food infection such as those caused by *Salmonellae* or *Staphylococcus aureus*. Certain characteristics, however, may give a clue. The onset in salmonellosis is usually more abrupt and occurs within twenty-four hours of consuming the infected foodstuff. Vomiting is more often noted in salmonella infections, and the purging diarrhoea and accompanying tenesmus tend to be more severe. With *Staph. aureus* food-poisoning the incubation period is still shorter (four to six hours), and usually a number of persons are attacked almost simultaneously. Vomiting is an outstanding feature and the patients may rapidly become greatly prostrated from the profuse vomiting and diarrhoea so that they seem profoundly ill. The rapidity with which the infected material is voided may be a saving feature, for it is fortunately true that recovery usually ensues with equal rapidity.

Dysentery can also occur in infancy, and here the question of *Bact. coli* gastro-enteritis must be considered. The presence of blood in the stools is uncommon in gastro-enteritis, whereas in infants with dysentery blood is often present. Further, the vomiting which is usual with gastro-enteritis can produce severe signs of dehydration very rapidly. Infection of the infant with dysentery usually arises from family contact with an older child with the disease, whereas clinical evidence of *Bact. coli* infections of older siblings is rarely seen.

The two conditions of a non-infective character which may cause difficulty are intussusception and acute appendicitis. So far as intussusception is concerned the age and sex will be important guides, but the need to carry out a rectal examination where any doubt exists must be emphasized, for this is the condition which is most commonly sent to hospital in error. An inflamed pelvic appendix may cause diarrhoea early in the illness, but the pain and tenderness usually associated with an appendicitis is not often encountered in dysentery. Further, when pain or tenderness is complained of in dysentery it is rarely localized. Here again a rectal examination will often prove of great assistance.

### Epidemiology

It must be confessed that the mildness of the disease now so prevalent has not served to encourage a very detailed study of its mode of spread in the community. The only index of the prevalence of the disease is the number of notifications, but clearly these do not represent the whole picture. Housing conditions appear to play some part in determining the incidence of the disease. Thus in a series of cases admitted to hospital in Liverpool I found that two-thirds came from the poorest type of accommodation, and, although the other third came from what would be

described as better housing, overcrowding and depressed standards of living were found. Similar findings are reported from Glasgow (T. S. Wilson, personal communication). Dysentery there was most prevalent, as judged by notifications, in the worst-housed areas of the city.

It would seem correct to regard the centre of infection as the family unit rather than the individual. Admittedly the highest proportion of notified cases is in the first five years of life, but when bacteriological examination is extended to the rest of the family many of the contacts, especially those of school age, will be found to be infected. These infected persons may excrete organisms for some time, the average period in untreated persons being placed by several observers at between two and four weeks. This must mean that every person in the family is repeatedly exposed to infection. It might indeed be said that the family environment becomes saturated with the organisms.

### Treatment

A few days in bed should suffice. Plenty of fluids should be provided, and the patient, if of suitable age, should always have a drink within reach. Soft foods may be allowed according to appetite, but fried foods should be avoided. The appetite usually returns to normal within a few days, but in the few cases which are more than mild premature additions to the diet, particularly of roughage, may lead to a return of abdominal discomfort and diarrhoea, and this may result in a further period of excretion of organisms.

The introduction of the sulphonamides appeared to revolutionize the treatment of bacillary dysentery, but *Sh. sonnei* infections were soon found to be more refractory than the other forms. In many areas of Britain now all or most of the strains of *Sh. sonnei* are resistant to the sulphonamides, and the practitioner is advised to obtain advice from his local laboratory from time to time about the sensitivity of the prevalent strains.

When the organism is sensitive to the sulphonamides both succinylsulphathiazole and phthalylsulphathiazole will be found effective. Sulphaguanidine is less so, particularly against *Sh. sonnei*. Phthalylsulphathiazole is more useful in treating *Sh. sonnei* carriers than the succinyl preparation. The usual adult dosage of succinylsulphathiazole is 4 g. daily for one week, and for phthalylsulphathiazole 10 g. daily for the same period. The daily amount is given in four doses. Children from 4 to 14 years should receive half, and younger children and infants one-quarter, of the adult dose. Oxytetracycline, tetracycline, and chloramphenicol have all been shown to be effective in producing bacteriological cure in bacillary dysentery. Their use, however, is not without danger. A variety of toxic effects have been described and a severe and sometimes fatal enterocolitis due to *Staph. aureus* has followed treatment with them. Therefore these antibiotics are better not used in general practice for the treatment of what is after all usually a mild and self-limiting disease with no mortality.

Oral streptomycin is very poorly absorbed and may be used with good effect, although, *in vitro* at least, *Sh. sonnei* rapidly becomes resistant to it. Combined treatment with streptomycin and a sulphonamide will often prove effective, but here again advice from the laboratory on the sensitivity of the local bacillus will prove useful. The daily dosage of streptomycin for ages up to 4 years should be 1 g., for ages 4 to 14 years 2 g., and for ages above that 4 g., all given in four doses a day: 1 g. will dissolve in 1 dr. (3.5 ml.) of water, but it is better to make it up in 4 dr. (14 ml.), so that the infant will get a teaspoonful dose (0.25 g.). The course should last for five days only.

### Outbreaks in Institutions

Many practitioners are in medical charge of institutions, both residential and non-residential. When dysentery breaks out in such places, not only the inmates but all staff members in whatever capacity they may function (resident, non-resident, permanent, temporary, or part-time) must be examined bacteriologically. Further, at least two negative examinations must be recorded before an individual is judged to be non-infected. It is as well to arrange with the matron of non-residential institutions such as day nurseries that when a child is found to have diarrhoea a rectal swab should first be taken and then the child sent home. Cases or carriers should be excluded from non-residential establishments until three negative bacteriological reports have been received, and it is wise to obtain two more after the return of the child or staff member. Residential institutions will usually transfer infected persons to an isolation hospital. When this is not possible any isolation block in being, or created for the emergency, must be organized with the strictest division of staff and facilities from those of the rest of the institution. The outbreak must be cleared up as quickly as possible to prevent the spread of infection, and therefore any drug to which the organism is sensitive may be used. It will be found, should the tetracyclines be used, that much smaller doses than those generally recommended are effective. A dosage of 5 to 10 mg. of oxytetracycline per kg. is sufficient.

### Conclusion

When a practitioner is called in to see a case of bacillary dysentery he is presented not with an infected individual but with an infected family. Should it be necessary for social reasons to admit a case to hospital—and these are generally the only reasons for so doing—the problem of the infected family will remain. While little or nothing can be done at present to prevent the infection passing from case to case and from carrier to case, something can be done to prevent explosive outbreaks due to cases and carriers handling food. The practitioner can do more useful work in preventing the spread of the infection than he can in attempting to cure it. Dysentery is a notifiable disease and practitioners should be scrupulous in notifying it. Where a member of the family of a patient is employed in the processing, distributing, cooking, or serving of food the practitioner should inform the medical officer of health by telephone. This will not only enable the latter to assess without delay the necessity for action at the food establishment, but he can agree with the practitioner which contacts are to be suspended from work. The medical officer of health alone can issue a certificate to the National Insurance Office covering the absence from work of contacts of communicable disease, thus enabling such persons to draw sickness benefit.

The practitioner should give simple advice on hygiene to the family. The importance of washing the hands after defaecation should be emphasized. The housewife should have explained to her the necessity for handwashing before handling food, on keeping visitors away for a period, and on making visits herself, particularly to homes with children. She should not handle food outside her own home. It may seem that much of this advice will fall on stony ground, but a grain may take root. Lastly, the practitioner should not only treat the case but also those members of the family who have, or recently have had, loose motions.

To many of us dysentery now occupies a similar position in our thoughts to the common cold, but its widespread prevalence in the community must imply low standards of hygiene, and for this reason alone it should receive more attention. Our knowledge of its natural behaviour will be advanced only by a co-operative effort by general practitioners, public health departments, epidemiological laboratories, and hospitals.

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**Next article on Emergencies in General Practice.**—"Senile Confusion," by Dr. Felix Post.

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# ANAESTHETIC ROOMS

BY

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M.R.C.P.

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The design of anaesthetic rooms has not received much attention in this country. They are often small, noisy, and inconvenient. They may be used as a convenient short-cut for students discussing the interesting findings in yesterday's necropsy. They are often cluttered up with the overflow of store-rooms, such as stacks of dressing-drums, which crash down at fairly frequent intervals. At least one hospital has both an internal and an external telephone extension with particularly loud buzzers in each anaesthetic room. The entrance and exit doors may be opposite to one another, so that if they are left partly open the incoming patient may see the remains of his predecessor being stitched up. The reader can doubtless add other features which are undesirable.

It may be thought that with adequately premedicated patients these inconveniences are trifling, but this is definitely not the case. Some operations are still done under local analgesia, while sedation must be extremely light in patients undergoing caesarean section. In any event, loud noises are apt to disturb the tranquillity of any patient who is not actually unconscious.

Some thought has, however, been given to the design of anaesthetic rooms in recent years (Hewer, 1953). Just before the Ministry of Health took over the hospitals the London County Council, after consideration of the problem, recommended that the minimum area of an anaesthetic room serving one theatre should be 196 sq. ft. (18.2 sq. m.), and that the corridor outside should be at least 7 ft. (2.1 m.) wide, so that trolleys could be turned easily into the door (Ward, 1949). It had also been suggested that anaesthetic rooms should be divided into two by means of a washable curtain, the patient being wheeled into a compartment looking, so far as is possible, like an ordinary room. Induction of anaesthesia having been attained by an intravenous barbiturate, the curtain could then be drawn back, when the gas-oxygen and other apparatus would be immediately available (Ostlere, 1950).

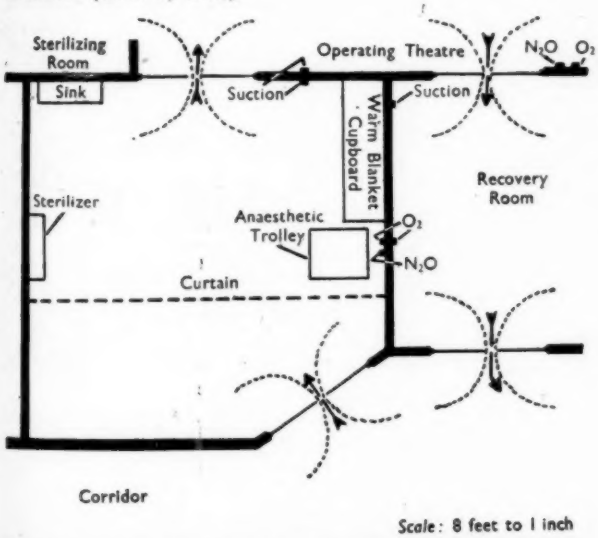


FIG. 1.—Plan of anaesthetic room for gynaecological theatre, St. Bartholomew's Hospital.

The building of the new gynaecological theatre at St. Bartholomew's Hospital enabled some new ideas to be carried into practice, and Fig. 1 is a rough sketch of the anaesthetic room.

It will be seen that the patient enters a small compartment shut off from the main anaesthetic room by a curtain. The only furniture is a homely-looking table and chair. The original idea of a false window with a mirror back and a shelf for flowers was abandoned when it was realized that the patient lying on her back with one pillow would normally see only the upper part of the opposite wall and the ceiling. It was therefore thought that a simple painting on these areas would be ideal for fixing the patient's attention and would have the additional advantage of presenting no difficulties in cleaning. A well-known mural artist, Mrs. Pamela Johnstone, very kindly offered her time and skill for this project, and has produced a really charming picture

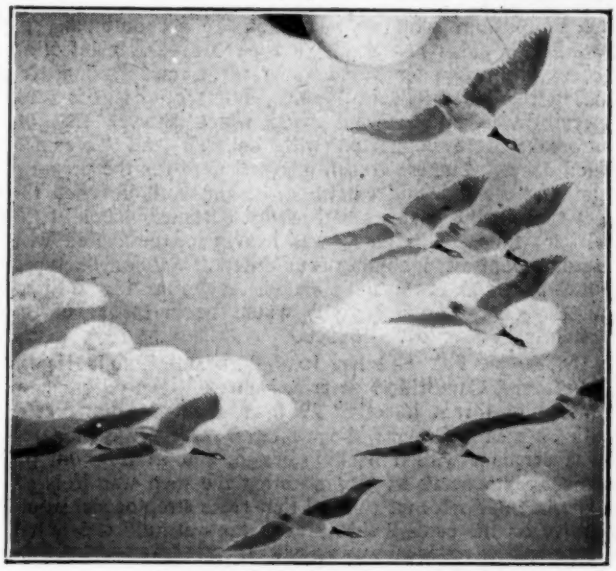

FIG. 2.—Photograph of ceiling of anaesthetic room.

of deer drinking at a pool for the wall decoration, while a gaggle of Canadian geese (*not* storks !) fly overhead (Fig. 2). It might perhaps be pointed out that these are not the only mural paintings in St. Bartholomew's Hospital, the previous artist being Hogarth (1697–1764).

Once the patient is unconscious the curtain is pulled back, when plenty of room is available for subsequent manœuvres such as intubation, setting up of intravenous drips, etc. Three wall plugs provide for nitrous oxide, oxygen, and suction, the small cylinders on the anaesthetic trolley acting as an emergency reserve. The cupboard for warm blankets has an opening, both into the anaesthetic room and into the adjoining recovery room. In order to save space the cupboard is insulated, and its top provides a shelf for laryngoscopes, tracheal tubes, syringes, etc. The room is fully air-conditioned, and all electrical switch gear is over 3 ft. (90 cm.) above the terrazzo floor.

I am greatly indebted to Mr. John Beattie, senior gynaecological surgeon to St. Bartholomew's Hospital, for his co-operation in attempting to provide an anaesthetic room which has at least some features which benefit the patients as well as the surgical team. Fig. 2 is a reproduction of a photograph taken by the Department of Medical Photography, St. Bartholomew's Hospital.

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# VARIETIES OF FOOD-POISONING

## AN INTERNATIONAL SYMPOSIUM

The Society for Applied Bacteriology held its first international meeting at Cambridge from July 4 to 6. The first two days were devoted to a symposium on "Food Microbiology and Public Health," at which the medical and scientific aspects of the subject were discussed, together with some of the problems of large-scale food processing, the sessions being arranged according to the type of food under discussion. The papers read at the meeting will be published in full in the December issue of the *Journal of Applied Bacteriology*.

### Synthetic Cream and Custard

Dr. K. W. NEWELL, Dr. BETTY HOBBS, and Miss MURIEL SMITH (Central Public Health Laboratory, Colindale) opened the symposium with a description of six outbreaks of *Salmonella paratyphi* B phage type 3A var. B infection occurring in Greater London, Windsor, and Basingstoke during the latter half of 1954. As this organism is rare, special investigations were made which showed that all outbreaks were connected with bakeries and "cream"-filled cakes. Chinese frozen egg was used for the preparation of "cream," and careful detection work unveiled the fact that all the bakeries had used a particular batch at the relevant time. This batch was heavily contaminated with faecal organisms, including four different *Salmonella* types, but *S. paratyphi* B was not isolated. As the result of a direct question, Dr. Newell said he would be in favour of the pasteurization of egg products.

Dr. R. M. FRY and Dr. JOAN BOISSARD (Public Health Laboratory, Cambridge) described an explosive outbreak of acute sore throat affecting 29 men about 36 hours after eating a meal. Custard, the suspected vehicle, was prepared by a sergeant with a hacking cough, and from whom the same streptococcus as that affecting the men was isolated. Experimental evidence showed that these streptococci would survive on the custard skin though the hot fluid was lethal.

Dr. HOBBS (Colindale) and Mr. H. B. HAWLEY and Miss MARGARET BENJAMIN (Aplin and Barrett Limited, Yeovil) referred to eight outbreaks of staphylococcal food-poisoning which affected schoolchildren. The usual vehicle was mock cream prepared from spray-dried milk of two particular batches. The type of staphylococci suggested that it was of human origin, and careful sampling of milk at various stages of the drying process showed that staphylococci from the cow were killed during the preliminary heat treatment, but that the human type was introduced at a later stage, prior to drying, when conditions were favourable for growth. Changes in manufacture had been made which eliminated this danger.

### Dried Coconut and Fruit

Dr. M. WILSON (Public Health Laboratory, Melbourne) and Dr. E. F. MACKENZIE (Victoria State Health Department, Australia) were unable to be present, but sent a tape recording of their findings in an outbreak of typhoid fever due to phage type E1. The cases were widely scattered in Melbourne and in other parts, but were unconnected with known carriers. Contacts of cases were found to be excreting numerous types of *Salmonella*, including *S. senftenberg*, which is rare in Australia. The key case was taken ill with food-poisoning due to *S. senftenberg*. As she continued to be ill she was reinvestigated and then found to have typhoid fever. This finding suggested that a food contaminated with a number of different salmonellae might be implicated. Careful investigation suggested desiccated coconut, widely used in Australia, as the source, and *S. typhi* type E1, *S. senftenberg*, and other salmonellae were isolated from it. The desiccated coconut was prepared under primitive conditions in Papua. Tribute was paid to the authorities in Papua, who have ceased production.

Professor M. D. APPLEMAN'S paper (Department of Bacteriology, University of Southern California) was read by Dr. M. Ingram (Low Temperature Station, Cambridge). Citrus fruit juice imported into Britain was pasteurized, but unpasteurized juices were sold in the United States of America. The unpasteurized juice might be contaminated with faecal organisms, which occurred more commonly if unsound fruit were used. This contamination might lead to public health problems.

### Fish and Meat

Mr. J. M. SHEWAN and Mr. J. LISTON (Torry Research Station, Aberdeen), pointed out that fresh fish rarely caused food-poisoning, but that processed fish was subject to contamination in the same way as other foods. Fish also reflected their environment; if kept in infected water they became infected, as demonstrated by an outbreak of food-poisoning due to smoked eels, the eels having been stored alive in infected harbour water prior to processing. The tunny group of fish contained histidine, which changed to histamine if spoilage occurred. Some authorities felt that this substance might account for some cases of poisoning. It was pointed out that the flesh of some fish was poisonous when eaten raw, but safe if cooked; that some fish were poisonous only at certain seasons, others only from certain waters.

Professor H. O. PEDERSEN (Municipal Veterinarian, Frederiksberg, Denmark) discussed the problem of botulism caused by *Cl. botulinum* type E. This type was almost always caused by fish, only one other vehicle, canned mushrooms, having been recorded. He pointed out that this disease is rare in Britain, but occurs in Europe, U.S.S.R., and U.S.A., where uncooked fish is eaten. He found that type E was present in mud taken from the sea bed round Denmark and Greenland, even at depths of 400 metres. It seemed possible that type E was part of the natural flora of sea mud, and that this might be the ultimate source of infection in fish.

Professor H. LUNDBÄCK (State Bacteriological Laboratory, Stockholm) described the largest outbreak of *S. typhi-murium* food-poisoning yet recorded, in which 8,845 were affected and 90 died. The outbreak was traced to fresh meat coming from one large abattoir. The outbreak was the result of a series of events in which, as the result of a strike of slaughterhouse attendants, the quarters for living animals were overcrowded. When the strike was over, the number of animals killed was greater than the facilities warranted. The source of infection, whether animal or human, was never discovered. The outbreak was controlled by shutting down the abattoir for cleansing, confiscating all meat from this abattoir, stopping the movement of livestock, and investigating all the slaughterhouse personnel, with segregation of the infected. The speaker thought it unwise to have large slaughterhouses, and was in favour of decentralization.

Dr. M. INGRAM and Miss ELLA BARNES (Low Temperature Station, Cambridge) gave a most interesting paper on the possible use of antibiotics for the preservation of meat. Of those tried, the broad-spectrum antibiotics were of most value. They could be used in four ways: in the animal feed, by injection prior to killing, for perfusing the carcass, or for incorporation in the processed meat. There was evidence that all methods gave good results of varying degree. It was pointed out, however, that in the U.S.A. antibiotics were regarded as undesirable and should be regarded as adulterants in food.

Dr. A. A. MILLER (Royal Infirmary, Preston) described two salmonella outbreaks due to meat pies. As a result of his experimental findings he concluded that pies could be rendered safe by adequate cooking. He suggested that the period and temperature required could be easily determined for each commercial oven.

Dr. R. BUTTIAUX and Dr. H. BEERENS (Pasteur Institute, Lille) discussed the presence of anaerobic sporing organisms in pasteurized canned foods.

### Causative Bacteria

Professor S. HAUGE (Norwegian Veterinary High School, Oslo) described four institutional outbreaks of food-poisoning affecting 600 people. The incubation period was about 10 hours. The symptoms were abdominal pain, profuse watery diarrhoea, and nausea. The vehicle in each outbreak was vanilla sauce, and the organism responsible was *B. cereus*. Experiments on human volunteers gave a similar clinical picture. The organism was isolated from the cornflour. The preparation of large quantities of sauce with the subsequent slow cooling gave the conditions required for the multiplication and toxin production.

Dr. JOAN TAYLOR (Salmonella Reference Laboratory, Colindale) reviewed the subject of coliforms and food-poisoning. She believed that a toxin type might be caused by some species of *Proteus*, and the infective type by some paracolon organisms. She thought more attention should be paid to mixed cultures in food, as the mixture might cause disease whereas the individual organism would be non-pathogenic.

Dr. B. MOORE (Public Health Laboratory, Exeter) reviewed the vexed subject of streptococci and food-poisoning. The outbreaks connected with these organisms gave a uniform clinical picture of the toxin type. He had been able to reproduce the disease in human volunteers using whole cultures or filtrates.

## PROGRESS IN SCIENTIFIC MEDICINE

### THE M.R.C. REPORT

[FROM A SPECIAL CORRESPONDENT]

The 1953–4 annual report, just published, of the Medical Research Council[1] gives an excellent picture of British research in all its aspects. It is at once a *Who's Who* of research workers and directing committees and laboratories in universities and hospitals, a synopsis of current research programmes from all over Britain, and a review of recent discoveries. In the year ended September 30, 1954, the Council spent nearly £2,000,000 of public money; in the same period it received various private grants and benefactions, including a quarter of a million from a group of tobacco manufacturers (for research on lung cancer), over £5,000 from Eli Lilly and Company, and—a tribute to the Council's high standing in American eyes—a grant from the United States Public Health Service for research on non-specific urethritis.

The first part of the report, as is now customary, reviews recent medical progress in a more general and non-technical way, like a series of good leading articles. This year the reviews lean more to the practical and applied than to the academic, and many of them are concerned with the problems of our highly industrial society: the employment of the neurotic in industry, diseases associated with an old source of power (coal—pneumoconiosis) and a new one (atomic energy—radiation sickness), and a disease associated with urbanization and now preventable, thanks a good deal to M.R.C. workers (retrolental fibroplasia), to name three. The most interesting long-term trend is the rapidly growing importance of tissue culture as a laboratory method, not only for researches in the aetiology of pernicious anaemia and the protection of living tissues from atomic radiation, and a deeper understanding of the ways in which substances like insulin or vitamin A produce their effects, but for the isolation of viruses and the preparation of vaccines to stimulate immunity to viral disease. Biochemistry naturally takes a big place in the review. If there is one field of medicine which as yet seems a little neglected by M.R.C. workers it is psychiatry.

[1] Cmd. 9506, 1955. H.M.S.O. Price 7s. 6d. net.
[2] *British Medical Journal*, 1952, **2**, 843.
[3] Ibid., 1955, **2**, 78.
[4] Ibid., 1954, **2**, 1470.

### Protection from Atom Bombs

Radioactive substances break down with the ejection of $\alpha$ particles (helium nuclei), $\beta$ particles (electrons), and $\gamma$ rays (natural $x$ rays). When these radiations strike living tissues the damage is not done through the fracture of molecules of enzymes or proteins which absorb the $x$ rays or receive a direct hit from a particle—such injury is relatively rare, often functionally unimportant, and may "heal" again chemically—but through the partial decomposition by the radiations of the water molecules everywhere into chemically reactive fragments which attack the cell's nucleic acids and proteins. These chemically reactive water fragments, or free radicals, have only a short life before they decompose spontaneously, but the presence of oxygen, or certain other substances such as quinones, increases their lives or creates further new reactive fragments to do further damage. Protection against radiation therefore implies killing off the free radicals from water as quickly as possible. Contrarily, increasing the sensitivity of tumours to radiotherapy means increasing the life of the free radicals which are generated in the tumour so that they do greater cell damage. Thus Professor J. S. Mitchell and his group at Cambridge have found that "synkavit," a close relative of vitamin K (which is a quinone), which is taken up preferentially by tumour cells, causing pain in primary and metastases almost as soon as it is injected intravenously and becoming visible by fluorescence in superficial tumours, makes tumours more sensitive to $x$ rays. The mean survival time of 46 patients with inoperable lung cancer was only 4 months after radiotherapy: a similar group given synkavit at the time of radiotherapy lived on the average nearly three times longer than the other group.

Protection of cells against activated water fragments is less advanced. The best radioprotector so far discovered is probably cysteine, a natural sulphur-containing amino-acid which enters cells and tends to lower intracellular oxygen concentration but also to kill off the free radicals of water as they are formed. In technical terms, it is a chain-breaker. The best it can do is to cut radiation damage by half, or raise radiation tolerance to the double dose level.

Another line of attack on the radiation problem is to improve regeneration of tissues already damaged by radiation. Thus adult mice can survive an otherwise lethal dose of $x$ rays if they are injected with normal splenic cells or bone marrow cells shortly after irradiation. It seems likely that in some as yet unknown way the normal cells stimulate the irradiated bone marrow to recovery, perhaps by liberating some essential chemical substance, as cells in tissue culture thrive best on the juice from crushed embryos. Here is the possible foundation of a therapy for radiation sickness.

### How Viruses go to Work

Viruses require living cells for their propagation. In the laboratory, culture of cells and tissues is still a difficult and complex business—except for bacteria, where seventy years of work since Koch and Pasteur have established simple routines. It is therefore the viruses which attack bacteria, the bacteriophages, which have so far been most studied, in the hope that their behaviour is typical for all. With the electron microscope American workers have shown that the T-series viruses which breed in a strain of *Bact. coli* are tadpole-like in appearance, a lump of nucleic acid in a protein sheath with a tail. Their attack can be seen in two stages. The first is a simple adsorption of virus to bacterial surface, and has the same reversibility and physical characteristics as adsorption to any other surface, such as glass. But the second stage is quite remarkable. The nucleic acid of the virus seems to be squirted into the interior of the bacterial cell, leaving the protein sheath outside. Once inside, this nucleic acid diverts the cell's metabolism to the manufacture of copies of itself and the production of

sheath protein—but only after a time interval during which the virus appears to have vanished altogether, and we can at present only guess what it is doing during this preparatory period. Eventually, however, the bacterial cell is but a husk which bursts to liberate the new virus particles. But there are some bacteriophages which take things more easily, do not smash up their host cells, and multiply more slowly to keep step with the host's growth and reproduction, so that every individual bacterium of a culture comes to be infected. Some viruses of higher organisms are similarly adapted, so that their presence is only made manifest by the signs of disease under special circumstances. Herpes labialis of man is probably one such.

Of animal viruses influenza has been the most studied, as it grows in the chorionic and allantoic cells of the chick embryo. Again the first stage of attack is an adsorption, but the second is probably an enzymic digestion by the virus of a portion of the cell wall made of mucoprotein, allowing ingress. Again the virus vanishes altogether for a time, then reappears in quantity and leaks out of the cell, which eventually dies. Chorionic cells behave differently from allantoic cells when infected (they die much sooner, for one thing), perhaps reflecting a difference in normal nucleic acid metabolism and pointing to a future opportunity for intracellular chemotherapy.

### Advances Based on Tissue Culture Experiments

The future of virus research, however, as of a good deal else in experimental biology, may well lie with tissue culture, the growth and serial subculture of fragments of different tissues taken from the whole animal. This requires rigorous asepsis, special complex culture media, and a whole range of special apparatus and methods, and, although practised for fifty years, it is only now coming into its own, not only for the isolation of the viruses of measles and chicken-pox or the study of poliomyelitis virus (and the preparation of vaccines), but in learning more about the action of vitamins and hormones. Thus the ectoderm of chick embryos can be grown *in vitro* in different media. Normally it becomes keratinized and forms skin. If deprived of vitamin A it becomes hyperkeratinized—as in clinical avitaminosis. But if the growing skin is cultivated in a medium containing an excess of vitamin A it not only fails to keratinize, it turns into a ciliated mucus-secreting epithelium just like that which lines the bronchi. This is a reversible morphological change, for if this typical respiratory tract lining is now transferred back to a normal vitamin A medium it becomes skin again. Now keratin is rich in sulphur, mostly in the (reduced) sulphur bridges of cystine; while mucus is also rich in sulphur, but as (oxidized form) chondroitin sulphate. So vitamin A in excess promotes the oxidation of sulphur, which is one biochemical change which may be behind the histological one.

Vitamin A also directly influences bone and cartilage growth, which is not surprising, since the ground substance of these tissues contains chondroitin sulphate in the form of mucoproteins. Hypervitaminosis causes the dissolution of the cartilaginous matrix; it also results in the disappearance of bone, without necrosis. Other substances also act directly on bone and cartilage in tissue culture. Insulin, for instance, impedes the growth of bone and the maturation of cartilage, while thyroxine itself, as well as tri-iodothyronine, also impedes bone growth but speeds the ageing of cartilage. Work of this kind is still in its infancy, but may be expected to throw light on the causes of congenital defects, and ultimately perhaps be used in modifying the growth of children in useful special ways, or in changing temporarily the structure of organs such as the skin to enable them to resist the spread of tumours or the action of toxic agents. Mucoproteins are important constituents of all connective tissue, not only bone and cartilage, and their study is relevant for such diseases as rheumatoid arthritis. They turn up in all kinds of places—for instance, on the surface of red cells, where they are the antigens responsible for the specific agglutinations of blood group typing; or in the stomach as intrinsic factor, the substance which promotes the adsorption of vitamin $B_{12}$, and without which pernicious anaemia results. The chemistry of mucoproteins is still relatively undeveloped and difficult, but this will change now that chemists are learning what interests biologists. The M.R.C. report points out that there was a delay of several decades in developing the drugs of modern chemotherapy because of an information barrier between the two branches of science. Sulphanilamide, for instance, was known to chemists many years before bacteriologists and clinicians took it up. But we are learning now how better to co-ordinate the endeavour of research.

### Field Studies of Disease

Much effort is now being expended on studies of colonial nutrition; and it is clear that the clinical diseases seen in under-developed countries are not the result of single vitamin or amino-acid deficiencies of the kind usually studied in the laboratory. It seems quite likely, for instance, that a degree of malnutrition (probably lack of good protein) plus malaria may result in a liver damage which neither factor acting alone would bring about. Kwashiorkor is an example of a disease in infants getting a qualitatively inadequate protein diet on weaning: pathologically there is not only fatty infiltration of the liver, with a degree of liver failure, but atrophy of the pancreatic and intestinal cells which make the digestive enzymes—and hence a failure to digest and absorb any good food later given. One practical problem is how to assess liver function really sensitively, and J. C. Waterlow has shown in Jamaican infants that two liver enzymes or enzyme systems may dwindle in activity long before other enzymes suffer or the usual gross tests of liver function show change: he measures cholinesterase and succinoxidase by micro methods. Another practical problem, not yet solved, is how to assess an individual's "protein saturation," how to measure his protein content as one can measure his haemoglobin. Unfortunately the plasma proteins, or even the plasma albumin which is made in the liver, are poor indicators. They show no change until the patient is far gone. Thus in European famine oedema plasma albumin remained fairly steady (but in kwashiorkor it drops).

Nearer home, the M.R.C. study of pneumoconiosis in a Welsh mining valley, the Rhondda Fach,[2] is more than just an attempt to discover whether "complicated" pneumoconiosis—progressive massive fibrosis of the lungs—is a simple innocent dust disease turned into a deadly one by the addition of tuberculous infection. The whole population of the valley is under prolonged clinical survey, so that diseases such as rheumatoid arthritis, asthma, bronchitis, and coronary artery disease can be noted as they occur and followed through for years. The primary purpose is to control and stamp out tuberculous infection in this one valley to see if the incidence of complicated pneumoconiosis drops, compared with other valleys where fewer precautions are taken. But it provides the opportunity to study general morbidity in a way which only a combine of many general practitioners could approach. And it has had numerous offshoots in developing ways of estimating degrees of respiratory efficiency, of accurate reading of chest *x*-rays, and of assessing the quantity of atmospheric dust of the size which alone penetrates to the lung alveoli.

### Other Work

Readers of the *British Medical Journal* are already aware of the contribution of M.R.C. workers to the solution of the mystery of retrolental fibroplasia[3]—a congenital blindness of premature infants which began to be noticed 10 years ago in countries with highly developed hospital services, where premature infants were put in oxygen tents. If the oxygen is kept below 40% no eye damage occurs. They will also know of the work done to develop a trilene inhaler suitable for midwives to use in childbirth at home.[4] They may be less aware that a clinical trial has shown that cortisone is beneficial in the attacks of ulcerative colitis, or

that the Council's trials are conducted with an extreme sense of responsibility to the patient, so that he gets all conventional forms of medical treatment whether he is "guinea-pig" or "control." In fact the M.R.C. has shown how it is possible to test the value of remedies in a precise, certain, and entirely ethical manner, and has set a world standard in this field. Finally, employers of labour will be interested to learn from preliminary results obtained by the Unit for Research in Occupational Adaptation that workers who are temperamentally unstable, or have a history of neurosis, produce as much as healthy workers, other factors being equal, and may be less prone to absenteeism, and no more likely than the healthy to throw up their jobs in less than six months from starting.

## THE PROTOPATHIC NERVOUS SYSTEM

### LORD ADRIAN AT FACULTY OF ANAESTHETISTS

The opening address at the scientific meeting of the Faculty of Anaesthetists on July 9 at the Royal College of Surgeons was given by LORD ADRIAN, O.M., P.R.S., his subject being "The Protopathic Nervous System." The abolition of unnecessary pain was the prime objective of all anaesthetists, he said, yet though great practical advances had been made in the management of pain their knowledge of its underlying physiological mechanism had not advanced to the same degree.

Nearly fifty years ago Head and Rivers put forward a theory based on the return of sensation after the experimental division of a sensory nerve. They believed that recovery took place in two stages. First, there was a fairly rapid return of painful sensation with awareness of extremes of temperature and diffuse localization; this was termed protopathic sensation. Later, the precise nature and degree of a stimulus—such as light touch and moderate temperature—would be appreciated; this was described as epicritic sensation. Their theory, however, was rapidly criticized out of existence, though it was true that many workers failed to repeat the experiments in their original form. But the sharp division of the sensory nervous system into two distinct divisions was not reflected in the observations made on nerve injuries in the first world war, and the authors of the theory had made no attempt to correlate the clinical findings with histological evidence.

#### The Present View

Lord Adrian went on to say that, in fact, histological and electrophysiological evidence showed that the sensory nerve fibres were not all alike, and that it was possible to recognize two extreme types, conducting rapidly and slowly, and seemingly responsible for the more precise and the more urgent forms of sensation. But Gasser and Erlanger, who had analysed the conduction rates, and Zotterman, who had recorded the impulses due to different stimuli, were agreed that there was considerable variation in the character of the fibres responding to a particular type of stimulus. Zotterman's recent analysis of temperature sensation showed that the nerve fibres concerned were mostly of the smaller, medullated variety. It was also true that non-medullated fibres were often activated by stimuli which would not be painful, although, in general, painful stimulation involved the slowly conducting non-medullated variety. In this manner the large and rapidly conducting fibres had come to be associated mainly with the non-painful stimuli such as light touch, and the small fibres with the painful stimuli, but a certain amount of overlap existed. There was therefore some similarity between modern thought and the original theory of Head and Rivers.

One of the principal objections to the old theory was based on the explanation of the gradual disappearance—during regeneration of the nerve—of the hypersensitivity to pain. Head and Rivers believed that epicritic stimuli could suppress protopathic ones, but the idea did not commend itself to physiologists. At the present time, however, the interaction of different sensory messages was well recognized in the central nervous system, for it could certainly take place in the reticular formation as well as at thalamic or cortical levels. The recent discovery of double sensory areas in the cerebral cortex might be taken to support a dual theory of sensation, but it seemed unlikely that the first and second sensory areas were specially concerned with the two extreme types of sensations.

The present conception of sensation, therefore, was that non-painful stimuli are carried by the more highly specialized signalling apparatus; they travel by the fastest route and their early arrival in the central nervous system may modify the reception of the slower discharges, which are more concerned with the sensation of pain. Thus, said Lord Adrian in conclusion, the theory of Head and Rivers could be seen as at least a valuable step in the analysis of the sensory system.

The other speakers at the meeting were Dr. W. GREY WALTER on electroencephalography in brain disease, Dr. B. D. WYKE on neurophysiological aspects of barbiturate narcosis, and Mr. W. BLACKWOOD, F.R.C.S., on lesions of the brain-stem following raised supratentorial pressure.

## POLIOMYELITIS RESEARCH

### THE PROBLEM OF THE VACCINE

A luncheon was given at the Savoy Hotel on July 15 by the National Fund for Poliomyelitis Research. Sir RUSSELL BRAIN, P.R.C.P., who presided, said that medical questions were nearly always much more complicated than they appeared at first sight, and the use of poliomyelitis vaccine was no exception. Difficulties had still to be overcome before there was a safe and universal method of preventing the disease. Meanwhile the need for treatment must not be forgotten. Here life-saving advances were being made. Patients who could neither breathe nor swallow were being kept alive until the acute stage was past, but this needed the team-work of groups of specialists and the resources of laboratories.

There were two reasons why this should depend on voluntary support. Although the Medical Research Council and the National Health Service supported research in this field there was scope for far more research than the State could afford. Secondly, a fund raised by private subscription had the advantage that it could act quickly, without waiting for the necessarily slower procedures associated with official deliberation.

#### Difficulties in Making a Safe Vaccine

Dr. G. S. WILSON, director of the Public Health Laboratory Service, addressed the company on vaccination against poliomyelitis. In 1935 Brodie and Park, in the United States, prepared a vaccine in which a suspension of infected spinal cord was treated with formaldehyde in order to destroy the virus. The resulting vaccine proved able to protect animals in the laboratory, but in human subjects certain disasters occurred and further use of the vaccine was forbidden. Soon after the war Enders and his colleagues at Harvard succeeded in growing poliomyelitis virus in tissue culture. This opened up the possibility of preparing a vaccine from pure culture of the virus instead of from a thick tissue-suspension of an infected animal. Salk, of Pittsburgh, was the first to realize the possibilities of this and grew the virus in a medium with a minimum amount of tissue, clarified the culture by centrifugation, and treated the thin suspension of virus with formaldehyde. Experiments on animals seemed to show that the vaccine was safe and that it gave rise to protective substances such as are found in those who have successfully withstood a natural attack of the disease. Arrangements were made for a field trial of the

vaccine on a gigantic scale, and the results, in April of this year, were regarded as a triumphant success, but it came as a great shock to hear, two or three weeks later, that children receiving certain batches of vaccine prepared by the Cutter laboratory had developed inoculation paralysis.

To those who had studied the problem of disinfection this sequel caused little surprise because of the narrow margin within which one had to work in attempting to kill a bacterium or virus for use as a vaccine. If too little disinfectant were used, not all the organisms might be killed; if too much, the chemical nature of the organism might be so altered as to deprive it of its power to give immunity. Even though Salk used a comparatively pure suspension of virus obtained by tissue culture, it contained a good deal of foreign matter derived from the tissues. There was no reason to believe that Cutters were to blame. They had a very good name, and it was a piece of sheer bad luck that their vaccine should have been singled out in this unfortunate way. In the laboratory the vaccine appeared to be safe, and yet, just as with Brodie's vaccine 20 years earlier, it was found when employed in the field to be dangerous. The human species was evidently more sensitive to the virus than any animal known.

### British Plans

Last month the Minister of Health, continued Dr. Wilson, had stated that the trial of the Salk vaccine which the Medical Research Council intended to hold this year had been postponed; it would be now more correct to say cancelled.[1] The Salk vaccine had been thrown right back to the experimental stage. Experiments were in progress to find a safer type of vaccine, in which the virulent strains of the Salk vaccine would be replaced by less virulent strains. It was hoped to establish a unit at Fajara, in the Gambia, where there was reason to believe that suitable strains of low virulence might be found. Meanwhile the laboratories working on poliomyelitis were attempting to map out the distribution of immunity in the population and obtain information which would be of great value in devising the field trial of the vaccine. Whereas 18 months ago there was only one laboratory in Britain—at Colindale—engaged in poliomyelitis research, there were now nine. Much of the credit for this increase must be ascribed to the National Fund for the material help and encouragement they had given to the Medical Research Council.

The development of a safe and effective method of vaccination against any disease, said Dr. Wilson in conclusion, had always been a long process. Attempts to protect against diphtheria and tetanus were begun in the nineties of the last century, and even now the vaccines, though strikingly successful, were not perfect. Poliomyelitis vaccine was not likely to prove an exception. Though outstanding progress had been made, they were still, he believed, only in the early stages of their endeavour.

[1] In a press statement on July 16 the Ministry of Health referred to Dr. Wilson's remark about the cancellation of the British trial of the Salk vaccine. After reaffirming that Government policy still rested on the statements made by the Minister of Health to the House of Commons, the statement continued: "So far it has been found best to abandon the idea of using the original form of the Salk vaccine, but modifications of the Salk type vaccine are certainly still the subject of research."

According to the Department of Health for Scotland Berwickshire is the first county in the United Kingdom in which all registered producers are now licensed for the sale of milk of certified or tuberculin-tested grade. About 90% of Scotland's 9,000 producers of milk now hold licences for the production of certified or tuberculin-tested milk, and the number is still increasing. The Department of Health claims that good progress is being made in other counties, and that within a few years all milk in Scotland may attain the high standard of cleanliness and safety already reached in Berwickshire.

## SNAKE-BITE, ANTHRAX, AND BOTULISM

Below is a list of centres in England, Wales, and Scotland which keep emergency supplies of sera for the treatment of snake-bite, anthrax, and botulism.

The Dispensary, Cumberland Infirmary, Carlisle (Carlisle 22332); the Dispensary, Newcastle General Hospital (Newcastle 35211); Castle Hill Hospital, Cottingham, Hull (Cottingham 47372); Seacroft Hospital, York Road, Leeds (Leeds 45194); Nottingham City Hospital, Hucknall Road, Nottingham (Nottingham 63351); Regional Blood Supply Depot, Brookland Avenue, Cambridge (Mon.–Fri. 8.30–5.30, Sat. 8.30–12.30, Cambridge 56912; all other times Cambridge 56913); North Middlesex Hospital, London, N.18 (Tottenham 3071; day—chief pathologist, night—resident pathologist); South-east Sub-depot, Weavering House, Ashford Road, Maidstone, Kent (Day Service—Maidstone 4468 and Maidstone 3604. Night Service—Maidstone 4660 and Maidstone 3718); South London Blood Supply Depot, Stanley Road, Sutton, Surrey (Vigilant 8221); Dispensary, Royal South Hants and Southampton Hospital (Southampton 26211) (snake antiserum only; this hospital carries serum not only against native snakes but against tropical snakes which may be imported in cargoes); Northampton General Hospital (Northampton 4680); Royal Berkshire Hospital, Reading (Reading 81721); Ham Green Hospital, Bristol (Bristol 31165); Pathological Department, Royal Devon and Exeter Hospital, Exeter (Exeter 3519); when laboratory closed, Exeter 2261); Scott Isolation Hospital, Plymouth (Plymouth 64311); Pathological Department, Royal Cornwall Infirmary, Truro (Truro 3029); Caernarvon and Anglesey General Hospital, Bangor (Bangor 1181); (botulinum and snake-bite antisera only); City Isolation Hospital, Cardiff (Cardiff 21466); West Wales General Hospital, Glangwili, Carmarthen (Carmarthen 7433) (botulinum and snake-bite antisera only); Dispensary, Selly Oak Hospital, Birmingham (Selly Oak 1361); Dispensary, Manchester Royal Infirmary (Ardwick 3300); Fazakerley Isolation Hospital, Liverpool (Aintree 2324); Bacteriological Laboratory, The University, Teviot Place, Edinburgh (Edinburgh 42542).

## ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

*As Bailiffs Grand Cross:* Lord Webb-Johnson, G.C.V.O., C.B.E., D.S.O., T.D., F.R.C.S., and Sir James Sands Elliott, V.D., M.D., LL.D., F.R.A.C.S. *As Knights:* Colonel C. P. Gaboury, O.B.E., M.D., and Mr. F. W. Law, F.R.C.S. *As Commanders (Brothers):* Surgeon Rear-Admiral S. G. Rainsford, M.D., M.R.C.P., Q.H.P., Colonel T. D. Inch, C.B.E., *M.C.*, M.D., F.R.C.P.Ed., Major G. R. H. Wrangham, M.R.C.S., L.R.C.P., Air Vice-Marshal J. C. Neely, C.B.E., M.R.C.S., L.R.C.P., Messrs. J. A. E. M. Hadley, F.R.C.S., L. W. Hefferman, M.D., F.R.C.S., and J. A. MacFarlane, O.B.E., M.D., LL.D., F.R.C.S., Drs. I. MacKenzie, G. E. Sawdon, C. P. Craggs, N. A. Rymer, and G. D. W. Cameron. *As Officers (Brothers):* Surgeon Captain S. G. Weldon, C.B.E., M.B., R.N., Major-Generals E. P. N. Creagh, C.B., M.B., M.R.C.P., Q.H.P., and R. Murphy, C.B., C.B.E., M.B., Q.H.S.; Colonels C. K. D. Edwards, T.D., M.B., and G. E. Wight, O.B.E., M.D.; Squadron Leader T. A. Evershed, M.B., Professor W. A. E. Karunaratne, C.M.G., O.B.E., M.D.; Drs. J. C. P. Bayley, P. B. Wood, W. H. Shilvock, R. Rutherford, T.D., E. I. Puddy, N. R. Rawson, O.B.E., J. B. Bramwell, J. B. Atkins, and D. B. McVittie. *As Associate Officer (Brother):* Dr. S. Ramanathan. *As Officer (Sister):* Dr. Annetta G. T. Anderson. *As Serving Brothers:* Acting Surgeon Captain H. R. Ruttan, O.B.E., M.D., Surgeon Commander E. D. Caldwell, M.D., R.N., Surgeon Lieutenant J. R. Lawrance-Owen, L.M.S.S.A., R.N., Colonel P. Tremblay, O.B.E., M.D., Major E. D. Portman, M.R.C.S., L.R.C.P., Group Captain G. D. Caldbick, M.D.; Drs. B. B. Kennedy, D. Vaughan, T. L. Oliver, B. S. Tulloch, A. S. R. Peffers, W. V. Roache, D. J. Turnbull, R. Johnston, C. P. Giles, H. A. Korn, R. P. Anderson, *M.C.*, T. D. M. Gillies, J. H. Richmond, R. G. Southern, D. B. Davies, E. Foster, G. ap-Vychan Jones, H. R. Kidd, D. R. B. Mathias, D. B. Phillips, A. C. Gouthro, D. L. Henderson, E. Marchand, C. Pomerleau, W. Verge, and E. R. Watson. *As Associate Serving Brother:* Dr. A. A. B. Omar. *As Serving Sisters:* Mrs. May F. St. J. U. Cosgrave, M.B., Mrs. Muriel A. Haigh, M.B., Mrs. Gwendolen M. O'Shaughnessy, M.B., and Mrs. Mary M. M. Evans, M.R.C.S., L.R.C.P.

# Correspondence

*Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.*

## Sudden Operative Death Due to Tumour Embolism

SIR,—The paper, "Sudden Operative Death Due to Tumour Embolism," by Dr. A. H. B. Masson and Dr. A. W. Branwood (*Journal*, June 25, p. 1514) is of great interest, but I believe that similar cases are not of extreme rarity. Thompson-Walker's textbook[1] comments on the risk of pulmonary embolism during operations on renal tumours. In recent years there have been further reports of sudden death due to pulmonary embolism by massive tumour deposits. Some of these deaths occurred "spontaneously" in the absence of any operation upon the primary tumours (Table I). There have also been reports of cases in which death has resulted from massive neoplastic embolism involving the systemic arterial system (Table II).

TABLE I.—*Reports of Deaths Due to Pulmonary Neoplastic Embolism*

| Authority, Year, and Journal | Site of Primary Growth | Relation of Death to Operation |
|---|---|---|
| Judd, E. S., and Scholl, A.J., 1924, *J. Amer. med. Ass.*, **82**, 75 | Kidney | Half an hour after operation |
| McLaren Todd, R., 1951, *Brit. J. Surg.*, **39**, 447 | Adrenal cortex | Ten minutes after operation |
| Gordon-Taylor, G., and Wyndham, N. R., 1947, *Brit. J. Surg.*, **35**, 6 | Testicle | Sudden death. No operation |
| " " | " | " " |
| Warren, S., 1931, *Amer. J. Path.*, **7**, 161 | Chondrosarcoma of sacro-iliac joint | No operation save biopsy 4½ months earlier. Death 8 days after first symptom of pulmonary embolism |
| Willis, R. A., 1952, *The Spread of Tumours in the Human Body*, 2nd ed., Butterworth, London | Round cell sarcoma of thigh | No operation. Sudden death in an attack of acute dyspnoea |
| " " | Leiomyosarcoma of uterus | Sudden death a few weeks after hysterectomy |

TABLE II.—*Reports of Deaths Due to Systemic Neoplastic Embolism*

| Authority, Year, and Journal | Site of Primary Growth | Relation of Death to Operation | Site of Embolus |
|---|---|---|---|
| Eason, E. H., 1950, *J. Path. Bact.*, **62**, 454 | Carcinoma of bronchus | 48 hours after pneumonectomy | Rt. middle cerebral artery |
| Miller, A. A., and Jackson, F. B., 1954, *J. Path. Bact.*, **68**, 221 | Myxosarcoma, left lung | No operation. Death 3 weeks after onset of hemiplegia | Rt. cerebral hemisphere |
| Aylwin, J. A., 1951, *Thorax*, **6**, 250 | Fibrosarcoma of back | 5 hours after pneumonectomy for solitary metastasis, rt. lung | Aortic bifurcation and coeliac artery |
| " " | Carcinoma of bronchus | 10 hours after pneumonectomy | Rt. middle cerebral artery and right axillary artery |
| Thompson, T., and Evans, W., 1929, *Quart. J. Med.*, **23**, 135 | Bilateral testicular teratomata | No operation. Death 5 days after onset of hemiplegia | Both coronary arteries. Right middle cerebral artery. Paradoxical embolism via patent foramen ovale |
| Loosemore, T. G. E., and Whittick, J. W., 1951, *J. Path. Bact.*, **63**, 133 | Malignant synovioma of knee | Death 24 hours after embolectomy. No operation for large pulmonary metastasis | Lt. axillary artery |

Here also it is likely that the condition is more common than reports suggest. Aylwin[2] has stated that cases like his had been reported to the Society of Thoracic Surgeons, and I have heard of further similar cases. My interest in this subject follows preparation of the report of a case in which death occurred during operation upon a malignant pulmonary tumour which was later shown to be of adrenal origin. Necropsy showed that the superior pulmonary vein on the side of the tumour was filled with friable growth, and the great systemic vessels were obstructed by large tumour emboli.—I am, etc.,

Penarth, Glam. W. R. PROBERT.

REFERENCES

1 Thompson-Walker, J., *Surgical Diseases and Injuries of the Genito-urinary Organs*, 1936, 2nd ed., p. 214. London.
2 Aylwin, J. A., *Thorax*, 1951, **6**, 250.

## Treatment of Auricular Fibrillation

SIR,—The treatment of auricular fibrillation by digitalization is very frequently hampered by the occurrence of most unpleasant nausea. A female patient, aged 65, started to fibrillate while convalescing from an attack of lobar pneumonia. Digitalis leaf and digoxin by mouth both produced severe nausea, necessitating withdrawal of the drug. She rapidly developed signs of congestive failure with a wildly fibrillating heart. Intravenous digoxin brought this under control, but fibrillation returned within 48 hours of discontinuing the injections.

She was then started on digoxin 0.25 mg. three times a day by mouth, each dose being accompanied by chlorpromazine hydrochloride 25 mg. No nausea occurred, and she has since remained well under control without the slightest sign of any unpleasant side-effects. The use of chlorpromazine was prompted by the recent report of its use in combating morphine nausea.—I am, etc.,

London, W.13. JOHN H. SWAN.

## Portable Oxygen Inhaler

SIR,—I read with interest Dr. Ronald Jarman's account (*Journal*, July 9, p. 138) of the B.O.C. portable oxygen inhaler. The medical use of small oxygen cylinders has been held up by the difficulty of evolving a satisfactory method for recharging, which the "sparklet" principle would appear to solve, and I look forward to trying the set when it becomes available.

Portable oxygen therapy is undoubtedly of great value in some cases of breathlessness due to chronic respiratory failure. We have been able to demonstrate a significant increase in exercise performance when selected patients breathe 30% to 100% oxygen instead of air, and are satisfied that in these instances the mental comfort which follows from the relief of breathlessness, and from the ability to walk upstairs or perform other essential tasks, whilst breathing oxygen, has a firm physiological foundation. However, Dr. Jarman appears to suggest that for the sake of mental comfort portable oxygen therapy should be prescribed in cases where it is of little physiological value. It is open to question whether this would be in the best long-term interest of the patient.

In the equipment which Dr. Jarman describes, the oxygen cylinder serves as a handle with which to hold the oxygen mask to the face. Used in this way there is a danger of the mask being tilted off the face, thereby decreasing its efficiency. The fact that the patient must hold it has the further disadvantage that he has only one hand available with which to support himself whilst walking upstairs or carrying out some other activity which to him may represent almost maximal exercise. The oxygen cylinder should clearly be as light as possible and will, of necessity, only contain a small quantity of oxygen, but, to be effective, there must be no danger of the supply running out during short periods of essential activity, amongst which might be included going to the toilet or having a bath. The present cylinder does not allow for these activities, as it contains only 22 litres of oxygen. At the same time it weighs

16 oz. (0.45 kg.), which appears to be unnecessarily heavy, since another commercially available cylinder of the same weight contains 50 litres when charged to the same pressure. The oxygen mask and control valve appear to be standard anaesthetic components, which are also heavier than other similar items in current use. It would be interesting to know how much they weigh.

It is possible that an alternative version of the equipment is envisaged, with a somewhat larger light-weight cylinder that will deliver oxygen up a tube to a light-weight mask from a convenient pocket. This would seem to be an improvement. Equipment of this design, weighing 2½ to 3½ lb. (1.13 to 1.59 kg.), including pressure-reducing valve and oxygen flow selector, and containing 120 litres of oxygen in rechargeable cylinders, is available. Two types, developed respectively from equipment used by B.O.A.C. and from that which facilitated the successful assaults on Mount Everest and Kanchenjunga, are at present undergoing domiciliary trial for the symptomatic treatment of patients with chronic respiratory failure.—I am, etc.,

Penarth, Glam. J. E. COTES.

## Uterine Inertia

SIR,—I was glad to find that Mr. Clifford Kennedy (*Journal*, June 25, p. 1522) had employed the older and simpler term of "uterine inertia" to describe a set of circumstances that may complicate labour (mainly in primigravidae, causing an appreciable rise in foetal and indeed in maternal mortality). Of late years there has been a tendency to over-elaborate many of our concepts. In particular, to speak of incoordinate uterine action as an entity is unwarrantable in the present state of knowledge. This term has certainly confused many cases of delay in labour, for more often than not the true cause of the dystocia has been some disproportion.

As regards the physiology of the uterus, there still exists a wide gap between the viewpoint of the experimental physiologist and the practising obstetrician, well illustrated by a remark of Professor G. H. Bell[1] of Dundee at the last British Congress of Obstetrics, in which he stated he "felt certain that the cervix is something more than the mere end of the uterus."

The risks of inertia, both maternal and foetal, were emphasized by MacRae[2] several years ago when he pointed out that in a ten-year period from 1939 the maternal mortality was no less than 4.7 per 1,000 and the foetal mortality 120 per 1,000. These risks were also stated nearly 100 years ago in that finely written chapter on "Laborious Labour" in the selected writings of Sir James Young Simpson,[3] in which he urged that one should wait to see what Nature can effect, not what she can endure.

Certain aspects of inertia, and the prolongation of labour with which it is inevitably associated, tend to be overlooked because they are too simple. The uterus cannot differ fundamentally in its behaviour from any other hollow muscular organ, in that when full it must empty itself. That no individual uterus can predetermine the gross volume of its contents when term is reached imposes certain important restrictions on the process of evacuation that make labour normally more complicated than micturition. Nature has decreed that the process in primigravidae, if it begins at sundown, shall usually have ended by sundown on the morrow. Modern caesarean section gives us a safe and certain method of obeying this decree if nature fails. An abundant experience should now have taught us when best to do so. Prolonged persistence with medical treatment for the various types of disorderly uterine action seems very close to a negation of common sense erected into a system of therapy.—I am, etc.,

Liverpool, 1. H. VINCENT CORBETT.

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1 Bell, G. H., and Nixon, W. C. W., *J. Obstet. Gynaec. Brit. Emp.*, 1952, 59, 617, 624.
2 MacRae, D. J., ibid., 1949, 56, 785.
3 Simpson, J. Y., *Selected Obstetrical and Gynaecological Works*, 1871, edited by J. W. Black, Edinburgh.

## A.I.D.

SIR,—I read with interest your report of the resolution on donor artificial insemination approved by the American Society for the Study of Fertility (*Journal*, June 25, p. 1539). My own convictions on A.I.D. are in complete accordance with the resolution. It is often argued that the woman concerned must be an obsessional neurotic. This obviously is true at times, but in carefully selected cases, where the maturity of the couple and the stability of the marriage has been assessed as good, what may be interpreted by some as an obsession is judged by others to be a strong healthy maternal instinct. Naturally there is a frustration, but that need not necessarily imply an obsessional neurosis.

I have practised A.I.D. in carefully chosen cases over many years and have not yet been faced with a bad result. In fact, with each passing year I am more than ever impressed with the deep content and satisfaction brought about by such a pregnancy.—I am, etc.,

London, W.1. PHILIP M. BLOOM.

## Anterior Tibial Syndrome

SIR,—Dr. D. C. Watson's two cases of "anterior tibial" syndrome following arterial embolism (*Journal*, June 11, p. 1412) are interesting in so far as they followed, within a few days, what appears to have been embolism of the *popliteal* artery. This suggests that, for the first few days, the anterior tibial artery received blood by collateral channels and that its eventual obstruction may have been due to distal extension of the thrombus.

In two cases recently under my care, both women suffering from mitral stenosis with auricular fibrillation, the syndrome was present in what may be described as pure form. The affected muscles were confined to the anterior tibial compartment and there was an associated neuropathy of the anterior tibial nerve. Muscle biopsy from one of these cases showed ischaemic necrosis. This corresponds more precisely to the description given by Carter[1] and Hughes.[2]—I am, etc.,

London, S.E.22. B. J. FREEDMAN.

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1 Carter, A. B., *et al.*, *Lancet*, 1949, 2, 928.
2 Hughes, J. R., *J. Bone Jt Surg.*, 1948, 30B, 581.

## Immediate Partial Gastrectomy for Perforated Peptic Ulcer

SIR,—I was highly interested to read the article by Mr. B. C. Rowlands and Mr. P. A. King on "Immediate Partial Gastrectomy for Perforated Peptic Ulcer" (*Journal*, May 21, p. 1254). The authors advocate partial gastrectomy for perforated gastro-duodenal lesions in carefully selected cases. As a matter of historical interest I wish to say that as long ago as 1894 Professor Rydigier (University of Lvov) advised and performed partial gastrectomy in all perforated stomach or duodenal ulcers, cancerous or benign. He was of the opinion that the results of such radical treatment were better than after simple closure of the perforation. He was a brilliant surgeon, and no wonder that in the hands of less skilled surgeons the mortality rate was so great that his teaching became obsolete and forgotten.

I was not always satisfied with the simple closure of the perforation, for post-mortem examination quite often revealed that a secondary dehiscence of the sutures with a generalized peritonitis was taking place. When an ulcer is of long duration its walls are infiltrated, hard, and brittle, and therefore an adequate simple closure of the perforation is rarely feasible. The surgeon after such a patching is under a false impression that he did a good job. After a few hours all the sutures, or a part of them, cut through, the perforation gapes, and the patient succumbs more or less rapidly. If a necropsy is not performed the truth cannot be revealed. From 1924 till 1931 the average time period of the perforation of peptic ulcers in the hospital in Poland

where I used to work was 25 hours, and the method traditionally adopted was simple closure. There was a mortality rate of 60%.

Since 1932, in dealing with perforated stomach and duodenal ulcers, I have applied the principle that when the ulcer's walls were in good condition, firm, and soft, and the perforation small, a simple closure was done; if the perforation was large, the walls infiltrated, hard, and brittle, a partial gastrectomy with removal of the ulcer was performed. The results of partial gastrectomies were so good that shortly afterwards I adopted the principle of doing an immediate partial gastrectomy in all perforated stomach and duodenal ulcers, regardless of the time period after perforation or the patient's age. The only contraindication for immediate partial gastrectomy was when the patient was moribund.

Since 1932, and up to 1953, I have done at least six to eight cases a year, with a mortality rate of nil when the perforation time period was below 12 hours, and with a mortality rate of 5 to 8% when the time period was between 12 and 48 hours. The great advantage of such a radical procedure is the fact that the patient has been freed from the inconvenience of being operated on a second time for persistent ulcer symptoms. The cardinal condition for success in immediate partial gastrectomy for perforated peptic ulcer is the surgeon's technical skill and experience and, as far as the patient is concerned, absence of peritonitis.—I am, etc.,

Harbour Island, Bahamas. L. ACHMATOWICZ.

## Labelling the Container

SIR,—Dr. H. Ucko's suggestion (*Journal*, June 4, p. 1392) that chemists should put the formula of any preparation on the bottle or container is one of the best that has appeared in the *British Medical Journal* for many years.

All of us who have tried to make out what a white tablet resembling aspirin might be will endorse his request. I suggest that those of your readers who are keen on the idea should bring the matter up at their local B.M.A. Division for discussion at the next A.R.M., as very considerable pressure will have to be brought on the chemists to bring this about.—I am, etc.,

Colchester. M. E. LAMPARD.

## Tonsillectomy

SIR,—I have read with much interest the article by Mr. J. C. Campbell and Dr. D. Hunter Smith (*Journal*, June 18, p. 1451), but, lacking their courage, have been waiting to see if one or more of my colleagues would write to you about it and expecting you would hear from Great Ormond Street.

Many of us are aware, as Mr. J. Crooks reminds us in his letter (*Journal*, July 2, p. 58), of the traditional method of tonsil removal in vogue at The Hospital for Sick Children. I remember very well my former general surgical chief returning many years ago from London, delighted with the "conjuring trick" demonstrated to him, I believe by Mr. Waugh, but in laryngology we had no beds to call our own at the Liverpool Royal Infirmary. Perhaps that was why we ourselves were compelled quite often to use the guillotine under brief anaesthesia, or refuse to accept cases in urgent need of operation. In due time we were given beds for otolaryngology but the guillotine was not put away, and I am convinced that the most merciful instrument to apply in the many cases suitable for its use is the modified double-bladed haemostatic tonsillectome of la Force, assisted by Mason's gag applied to the molar area of the teeth.

I am encouraged that more than one of my former assistants agree with me, though one of them uses Popper's modification, because he prefers its action and it has been easier to purchase, though both instruments are expensive. Another colleague decided to change over to dissection as a routine in patients after a certain age, but expects them to suffer more discomfort afterwards. I apologize to Mr. Crooks if I have disregarded his wish to enter into a discussion about the operative technique for removal of tonsils. I have never visited The Hospital for Sick Children, but hope Mr. Crooks will invite me to meet him there one day and see him at work, and afterwards to spare the time to retire from the operating room and discuss the fascinating subject of the physiology and pathology of the lymphadenoid tissue of the throat, including the pleasing architecture of the fauces. We could also continue the discussion about children with middle-ear deafness which he has opened in his letter, and about extending our adenoid operations into the lateral pharynx where lies the vulnerable Eustachian orifice. I look forward to the day when we shall be able to treat the lymphadenoid tissue of the throat without operation, though I would exclude radiotherapy.

From the evils of poliomyelitis at least we have obtained some useful ideas about the defensive mechanism of the tonsillar tissues, which Torsten Skoog[1] once suggested had a sensitizing effect on the reticulo-endothelial system of the body. The general practitioner is showing special interest in the subject under the auspices of his College, and it is most comforting to be informed during this year of arrangements for long-term investigations in family practice.—I am, etc.,

Liverpool. H. V. FORSTER.

REFERENCE

[1] Skoog, Torsten, *Acta oto-laryng. (Stockh.)*, 1936, **23**, 63.

SIR,—After reading in your journal a letter from Mr. James Crooks (*Journal*, July 2, p. 58) I think the part played by the Hampstead General Hospital in establishing the sound practice of dissecting tonsils and adenoids might not be fully appreciated by everyone at the present day. That pioneer of dissection, Mr. Waugh, was a general surgeon on the staff of this hospital for many years: one of the sisters who is retiring this year tells me she remembers his taking at least an hour over each dissection, being most meticulous about the complete removal, the direct inspection of the adenoidal bed, and the complete arrest of all haemorrhage before leaving the table.

Only by following his example can we hope to obtain the maximum benefit from this operation where it is indicated.—I am, etc.,

London, W.1. E. OLIVER HARRIS.

## Book Reviews

SIR,—For once I would cross swords with Sir Heneage Ogilvie (*Journal*, July 2, p. 58), the author of so many brilliant papers in the *British Medical Journal* and other journals, regarding the signing of reviews. I was glad to participate in the correspondence which led to the signing of these notices by the *British Medical Journal*. I maintain that if the writer uses his name—and who of our profession would get a book published anonymously?—reviewers should use their name. True, certain novelists have used a *nom de plume*. *Jane Eyre* was first published under the name Currer Bell, but that was because, like George Sand, she did not think a woman's name would satisfy her publisher. The reviews tend to be kinder. *The Times*, the *Daily Telegraph*, the *Manchester Guardian*, the *Sunday Times*, and the *Observer* all use signed notices. Authors should not be potted at by unknown friends or enemies.—I am, etc.,

Birmingham, 28. A. P. BERTWISTLE.

## Physique of Children

SIR,—The claims of Dr. R. W. Parnell *et al.* (*Journal*, June 25, p. 1506) are of great interest and potential importance. It is thus unfortunate that misleading statistical methods have been used. Their fallacy may best be exemplified thus: if a set of examination candidates be divided at random into 7 groups, and their performance assessed, it is quite likely that the group which happens to do best will differ "significantly" in performance from the

remainder. This is the method used by Parnell *et al.* to establish, for instance, that Lf girls were "significantly" more successful than the rest.

The data may conveniently be examined by the $\chi^2$ test, to determine whether the distribution of above and below average performance among the different somatotypes differs from that to be expected upon a purely random distribution. The test, applied to the intelligence test results, shows a highly significant unevenness of distribution among the somatotypes for girls, but it fails to show any such unevenness for boys. It is in fact quite likely ($P > 0.05$) that above-average scores in intelligence test are randomly distributed among all somatotypes for the boys; and the authors' statement, "The boys' results were not as highly significant as the girls'," is a masterly meiosis.

It may be that with more suitable treatment, or more extended observations, significant differences between performance of boys of different physique might emerge. In the meantime, it is unfortunate that the reader should be misled by a series of statistical calculations of whose invalidity he may be unaware.—I am, etc.,

Manchester. J. N. MILLS.

## Comforters

SIR,—Dummies have gone out of fashion, and to-day the child sucking a dummy is a rarity. It may or may not have been a good thing for the baby's psyche, but aesthetically it was horrible.

I have been intrigued by the substitutes which modern babies are adopting. Most of the babies of my acquaintance become thumb-suckers during the neonatal period. This satisfies them for a time, but after a while they take to holding the corner of a sheet, nappie, or eiderdown in the hand, sucking the thumb at the same time. After the age of 6 months or so they will not indulge in thumb-sucking unless they have this "comforter" with them. When they get to the age of 2 or 3 they usually give up the thumb-sucking but retain great affection for the nappie or eiderdown, and will not go to sleep without it. Intelligent parents will by now have reduced the size of this comforter to manageable proportions—what used to be a sheet or nappie has now become a handkerchief—but I have seen children of 3 or 4 years of age dragging a huge eiderdown or dirty old rug around with them wherever they go. This introduces great problems when these articles have to be washed.

The child's need for a comforter is particularly great when the mother is temporarily absent, and it seems to replace the mother in some way. I can understand the reason for the thumb-sucking, but why the handkerchief? Is it solely because of its early association with the thumb-sucking, or are there other reasons? I should be most interested to hear what the child psychiatrists have to say about this.—I am, etc.,

Dereham, Norfolk. NIGEL SWALLOW.

## Diversities of Sex

SIR,—It is said that to the average Englishman all Chinese look the same, but when one has contact with them they assume individual differences. In my opinion the problem of homosexuality is much the same. There is no sixth sense which homosexuals possess enabling them to detect others similarly inclined. No doubt it appears so merely because the homosexual observes things which the average normal man misses, or else does not know how to interpret. As one who has the good fortune to be sexually normal, but who has had the opportunity of treating a large number of homosexuals, I find it easy in everyday life to sort the sheep from the goats. The ultra-effeminate homosexual is, of course, easy to detect, but little points show the homosexual who presents a more normal aspect. For example, the voice is either light with a peculiar intonation or else harsh and croaking (perhaps as an attempt to conceal its effeminate nature). Little gestures show the truth of Freud's aphorism that "if a man lies with his tongue he tells the truth with his hands," and so on.

Surely the comparable example is how a man who is amorously inclined is able to pick a woman, say at a party, who is likely to accede to his approaches. Surely this needs no sixth sense, but the conscious observation and intuition (unconscious deduction from minute movements, etc.) of which everyone is capable to a more or less degree.

May I say, in conclusion, how much I enjoyed Dr. C. N. Armstrong's paper (*Journal*, May 14, p. 1173), which was so balanced and sensible?—I am, etc.,

London, W.1. CLIFFORD ALLEN.

## Chlorpromazine

SIR,—The article on a case of liver damage following chlorpromazine therapy by Dr. B. S. Hartnett (*Journal*, June 18, p. 1458) is of interest, as a similar case has been recently under observation at Bromley Hospital, showing remarkable similarity in clinical course and even to probe findings at laparotomy.

The patient, a woman aged 78, was admitted on March 21, 1955, in a semi-comatose state. She was hypertensive and arteriosclerotic, but no sign of cerebrovascular incident was present. Some five hours later she could talk fairly sensibly, but had no memory for recent events. Auricular fibrillation was present, easily controlled by "digoxin." A an alternative to barbiturates, which were not well tolerated, chlorpromazine 50 mg. was given at night for ten days. She made a good recovery and was discharged on April 12. On May 3 she was readmitted with marked jaundice of an obstructive nature. The sedimentation rate was raised; the serum alkaline phosphatase was 27.5; icteric index 100; and the thymol turbidity 1 unit. No other significant haematological or serological findings were present. Liver biopsy was not undertaken, and, as the icteric state persisted, laparotomy was performed by Mr. W. P. Greening on May 17. The gall-bladder was normal and no other palpable abdominal abnormality was present. The common bile duct was not dilated and was opened and explored. A probe could be passed down into the duodenum, but, on passage upwards, obstruction was encountered and the right and left hepatic ducts could not be entered. A T-tube drain was inserted into the common bile duct. Recovery was uneventful and bile drained freely from the T-tube. Jaundice gradually cleared, and a cholangiogram undertaken on May 24 demonstrated normal gall-bladder filling and wide retrograde filling of the hepatic ducts. The contrast medium flowed easily into the duodenum. The jaundice has now completely cleared; the patient feels well and is ready for discharge from hospital. The mental state is virtually unchanged. At no time during her illness was eosinophilia present.

In view of the increasing use of chlorpromazine it would seem to indicate that a more conservative attitude in the management of complicating hepatitis is advisable.—I am, etc.,

Bromley, Kent. D. N. DOBBIE.

## The Changing Face of Medicine

SIR,—"Home Posting" in his letter (*Journal*, July 2, p. 60) says that Dr. G. T. Tate's statement (*Journal*, June 4, p. 1390) that the R.A.M.C. provides facilities for post-graduate study which are unrivalled in the civilian medical world is "patently absurd." As one of the "unsympathetic" regulars whom "Home Posting" castigates, I always considered that the senior course of 17 months, during which I studied at the Westminster Hospital, the College of Surgeons, and St. Thomas's before taking a higher diploma, was a generous, far-sighted, and unique opportunity, for which I am profoundly grateful. Whilst on these courses many of the other doctors on them expressed envy and surprise at my good fortune, and none quoted similar opportunities available in civil life, so perhaps "Home Posting" would elucidate the "absurdity" of Dr. Tate's contention.

Surely, Sir, the correct procedure for "Home Posting" and others who regard their period of National Service as a waste of time is to do their National Service as a private soldier before studying medicine, and thus avoid the "utter frustration" which he describes.—I am, etc.,

"IN ARDUIS."

### Opportunities for Medical Practice

SIR,—I write with reference to the very stimulating article (*Journal*, May 14, p. 1171) entitled "Opportunities for Medical Practice at Home and Abroad" by Sir Stanley Davidson, professor of medicine in the University of Edinburgh. Attention was drawn by Sir Stanley in particular to the serious position of Scottish and Irish graduates in relation to employment. Well, Sir, there are excellent opportunities in the Royal Australian Navy for medical officers, and bright prospects for advancement for keen young men. There are now two hospitals officially recognized for the residency requirements for registration—namely, Balmoral Naval Hospital in Sydney and Flinders Naval Hospital near Melbourne, both of which have a panel of regularly visiting consultants. Rates of pay have recently been raised. These, with conditions of service, may be obtained from R.A.N. Liaison Officer, Australia House, London, W.C.2. While such splendid chances of progress are available to United Kingdom doctors in a rapidly developing and expanding country such as Australia there is no need for despondency regarding employment. Medical officers who are physically fit and of the right type will be very welcome in the Royal Australian Navy, where a very real job of work awaits them. Entry of graduates can be effected by the Australian Naval Liaison Officer in London, to whom completed application forms should be sent. Medical examination can be arranged at the nearest naval depot or hospital in England or Scotland, and, if passed as fit, subsequent interview would take place in London. Medical officers who enter the R.A.N. from abroad for a period of four years are granted a first-class passage for themselves, wives, and families to Australia. Return passages, however, are not granted.—I am, etc.,

Melbourne, Australia. L. LOCKWOOD.

### "Over-the-counter" Spectacles

SIR,—From time to time there appear in the press scare-provoking protests against "over-the-counter" glasses. The latest appeared in *The Times* on June 30, where it was reported that the conference of the North Regional Association for the Blind had recommended the Ministry of Health to suppress their sale. To what end?

I have been an ophthalmic surgeon for 50 years, and spent most of the time as a senior consultant to an important eye hospital, to a school for the blind, and to a large school clinic, and I have yet to come across an eye that has been visually damaged by glasses, however wrong or wherever bought. Temporary discomfort and inadequacy, perhaps; but such symptoms are not unknown with medically prescribed glasses. And patients usually have the common sense to discard unhelpful glasses just as they do opticians' and even oculists' misfits. I have known cheap glasses from stores to be a boon to hundreds of presbyopes with small means, and, I repeat, no damage to sight has been done.

As for the possibility that the treatment of some chronic disease may be delayed—in these days a remote chance—I seem to remember the same argument when ophthalmic surgeons sought to deny the right of opticians to prescribe glasses. After all, there was a time, historically not so very long ago, when only "over-the-counter" glasses were available, and electric light and sewing-machines had not yet replaced the candle and the fine hand-sewing. According to the scaremongers, blindness should then have been rampant, but was it—at any rate from that cause?—I am, etc.,

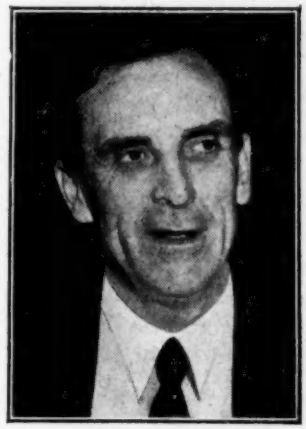
Portsmouth. W. S. INMAN.

# Obituary

## CHARLES DONALD, O.B.E., Ch.M., F.R.C.S.

Mr. Charles Donald, surgeon to the London Hospital and the Hospital for Sick Children, Great Ormond Street, died at the Royal Masonic Hospital, London, on July 8, aged 59.

Charles Donald was born on February 14, 1896, the son of John Donald, of Aberdeen. From Robert Gordon's College he went on to the University of Aberdeen to study medicine, graduating M.B., Ch.B. in 1922. During the first world war he served as a combatant, first as a lieutenant in the Gordon Highlanders and later in the Royal Flying Corps and the Royal Air Force, in which he became a flight commander, being mentioned in dispatches. After qualifying and holding resident posts at Aberdeen Royal Infirmary, Donald was appointed house-surgeon to the Hospital for Sick Children, Great Ormond Street. By this time he had decided on a career in surgery, and in 1925 took the F.R.C.S. of England. Five years later he proceeded to the Ch.M. of Aberdeen with a commendation. His first post at the London Hospital was that of surgical registrar, but it was not until 1933 that he obtained the appointment of assistant surgeon there, and two years later he joined the staff of the Hospital for Sick Children, Great Ormond Street.



[*Kemsley Picture Service*

His special interest in thyroid surgery was encouraged by his appointment as surgeon to the London County Council's thyroid clinic at New End Hospital, and in time he became one of the leading authorities on thyroid surgery. But he was always a general surgeon, and during the course of his career contributed papers on a variety of surgical subjects to the medical journals. So far as children's surgery was concerned he was particularly interested in developmental errors in the neck, a subject on which he published a paper in 1938.

A popular teacher at "The London," he was always ready to help the newly qualified and was a very active supporter of the students' clubs. For a short time before the war he served on the Medical Students and Newly Qualified Practitioners Subcommittee of the B.M.A. During the second world war he served in the R.A.M.C. as a lieutenant-colonel from 1940 to 1942, when he was promoted to brigadier and appointed consulting surgeon to the Middle East and Central Mediterranean Forces. From 1944 to 1945 he was consulting surgeon to Southern Command. Mentioned in dispatches early in 1944, he was appointed O.B.E. in April of that year. On demobilization he retired with the honorary rank of colonel, but he relinquished his commission in 1946 owing to ill-health. On his return to practice in London Mr. Donald was appointed to the staff of the Royal Masonic Hospital.

For some time his health had not been good, and two years ago he had to give up much of his professional

work. In 1927 he married Amy Stewart, daughter of the late G. Walker, and she survives him, together with a son and a daughter.

Mr. A. J. WALTON writes: As one who was trained by Charles Donald I should like to add my appreciation. I was first a dresser on his firm in the middle 'thirties, a few years after his appointment to the staff of "The London." The "Banger," as he was affectionately called, already had a great reputation as a teacher, and his firm was a popular one. His brilliant wit and repartee were the perfect counterpart to the quiet and rather sly humour of the late Charles Lindsay, whose junior he then was. His teaching was never formal, but he always encouraged the student to see and feel all that he could and above all to think for himself.

He had read very widely and was able to quote from innumerable poets. The quotations were always relevant and quite spontaneous. He once had to perform an orchidectomy on a youth who had been admitted during his operating session with a five-day-old torsion of testis. As the gangrenous organ was removed he quoted from Gray's famous *Elegy*:

> "Some mute inglorious Milton here may rest,
> Some Cromwell guiltless of his country's blood."

Shortly after the war I had the privilege to be his first assistant for three years. He took real pains to help the trainee. We had to assist with every thyroid for several weeks and then under his supervision gradually took on a little more personal responsibility—at first only exposing the gland and closing the wound. Only then did we perform solo and at first on carefully chosen cases. We soon learnt that any mistake could be frankly discussed with him, but woe betide anyone who tried to bluff away their error.

Although he was a rather difficult man to know, he was very kind-hearted. Against the Smart Aleck his sarcasm could cut like a sword, but he would go to infinite trouble to help his juniors and students. His great charm made all who worked for him want to give of their best.

He loved "The London" that had adopted him and took real interest in all its activities. I think he disapproved of many post-war changes, but never gave the impression of stubborn conservatism. The wards and out-patients will seem quiet and dull without him.

## JAMES H. KING, P.C. (CANADA), M.D.
### LL.D., F.A.C.S.

We record with regret the death in hospital at Ottawa on July 14 of the Hon. J. H. King, a former Speaker of the Canadian Senate and a founder Fellow of the American College of Surgeons. He was 82 years of age.

James Horace King was born at Chipman, New Brunswick, on January 18, 1873, the son of the Hon. G. G. King, and was educated at St. Martin's Academy and at McGill University, where he obtained the degrees of M.D., C.M. in 1895. After graduation he was in practice at Andover and St. John, both in New Brunswick, until 1898, when he moved to Cranbrook, British Columbia, where he became chief surgeon to the Crow's Nest line of the Canadian Pacific Railway.

King first came to prominence in Canadian politics in 1903, when he was elected representative of Cranbrook in the British Columbia legislature. He was Minister of Public Works in the government of British Columbia from 1916 to 1922 and in the Dominion Government for four years from 1922—the year in which he was elected to the House of Commons as a Liberal and also admitted a Privy Councillor of Canada. From 1926 to 1930 he held office as Minister of Pensions and National Health in Mr. Mackenzie King's first administration, work which to him had a particular appeal and to which he brought a first-hand knowledge of medical affairs. He gave up administrative duties in 1930 to accept a seat in the Canadian Senate, but in 1942 he was recalled to the Cabinet as Minister without Portfolio, and from that time until 1946, when he became Speaker, he led the Government in the Senate. He continued in office as Speaker until 1949. He was a delegate to the World Security Conference held at San Francisco in 1945.

King was vice-president of the Graduates' Society at McGill University in 1908, and in the following year attended the Western Congress of Medicine and Surgery at Budapest. In 1913 he became one of the original governors and a founder Fellow of the American College of Surgeons, which was established in that year, and he was an honorary member of the Royal College of Physicians and Surgeons of Canada. The honorary degree of LL.D. was conferred upon him by Acadia University, Nova Scotia, in 1923 and by Ottawa University in the following year. For some 50 years King, without seeking the limelight, played a useful part in Canadian politics, and he will be remembered as an efficient administrator and a modest and friendly man.

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The sudden death occurred in his home at Cottingley Bar, Bingley, Yorkshire, on July 1, of Mr. H. A. RIPPINER, consultant gynaecologist to the Bradford group of hospitals. He was 64 years of age. The son of a Congregational minister, Henry Anthony Rippiner spent the early years of his life in Yorkshire and Lancashire, and went to school in Wakefield. As a young man he entertained the idea of becoming a medical missionary and spent a year in preparation for this vocation at the Yorkshire Congregational College, before proceeding to Edinburgh to study medicine. After graduating M.B., Ch.B. in 1914, he was appointed house-surgeon to the Bradford Royal Infirmary. Owing to the shortage of junior medical staff he soon obtained the appointment of resident surgical officer—an arduous appointment which he conscientiously filled until 1919, when he became a partner in general practice in Bradford. Towards the end of 1923 Rippiner, who had taken the F.R.C.S. of Edinburgh six years earlier, was appointed assistant surgeon to the Royal Infirmary, and in 1927 was put in charge of the massage and orthopaedic departments. Some years later he became assistant surgeon to St. Luke's Hospital and assisted Dr. Rawson in the maternity department. In 1934 he was appointed to the full staff of the Royal Infirmary and gave up general practice. He became attracted to gynaecology, and in 1938 took the M.R.C.O.G. From then onwards he gradually gave up general surgery, and ultimately confined himself to obstetrics and gynaecology. Always interested in the administrative side of the hospital, he served on many committees and acted as honorary secretary to the Staff Committee for many years. When the new Infirmary buildings were being planned he was active in helping to raise funds for them. From 1947 to 1948 he was chairman of the Bradford Division of the B.M.A. Rippiner assumed no frills. He was very sociable and loved a game of bridge with his friends. Essentially simple and kindly, he thought evil of none and had no enemies. His judgments were always fair. He was struck down by a serious, incapacitating, and painful affliction in 1948, but carried on with his work until a few days before his death. In spite of all that he suffered—and in the full knowledge that he might die suddenly at any moment—he remained calm and unruffled and was never known to complain. He will be sorely missed by his many friends and patients and by all his colleagues. He is survived by his widow and one daughter. Mrs. Rippiner shared in his afflictions in a very real way, and together they provided a

shining example in Bradford of the old Roman virtues of *dignitas, gravitas,* and *serenitas,* tinctured with a spice of gaiety.—G. W. T.

The death of Dr. JOHN CLAYRE at the age of 63 on July 7 has deprived Southampton and district of one of its outstanding personalities and the medical profession of a wise counsellor. Oscar Theodore John Christensen de Hegartier Clayre was born on May 29, 1892, and after studying abroad he became a medical student at St. Bartholomew's Hospital, where he qualified in 1919. He then went into the Colonial Medical Service for a time and served in the Falkland Islands, before settling in Southampton in general practice in 1928. Dr. John Clayre, who was a past-president of the Southampton Medical Society, was an indefatigable worker for the medical profession, and he first represented his Division at the Annual Meeting of the B.M.A. in 1932. He continued to act as a representative until 1953. From 1931 to 1935 he was honorary secretary of the Southampton Division and chairman of the Division in 1945–6. He was assiduous in his attendance at meetings, where his experience and considered opinion were of great assistance to the officers of the Division. For over twenty years he was a member of the Southern Branch Council, of which he was secretary from 1935 to 1946, and in the following year he served as president of the Branch. At Annual Meetings he was a popular figure and made many friends. He served on a number of the committees of the B.M.A., including, for a short time, the Journal Committee, and he was a past-chairman of the Secretaries' Conference. His B.M.A. activities, however, were only a small part of his service to his colleagues, and it was perhaps in the local medical committee that he did his best work for the medical profession. For nearly twenty years he was secretary of the Southampton local medical committee, in the work of which he was engaged right up to the time of his death. He was also chairman of the Hampshire local medical committee, and earlier this year he had been elected chairman of the Hampshire Executive Council. For many years John Clayre was a keen member of the St. John Ambulance Brigade. He held office as County Commissioner in Hampshire, and in recognition of his work he was made a Knight of the Order of St. John of Jerusalem last year. A member of the Home Guard, he played an important part in the reorganization of this force after the last war. After an illness two years ago he moved his home to Netley Abbey, but continued to practise in Itchen, the district of Southampton in which he had first settled. A man of great culture and high Christian ideals, John Clayre will be sadly missed by his many friends. To his widow and three sons we extend our deepest sympathy.—J. G. Mc.D.

Dr. ROBERT GRANT died at his home at West Runton, Cromer, on July 7 at the age of 88. A native of Banffshire, Robert Grant was born on November 8, 1866, the eldest of a family of 10, and was educated at Aberdeen University, where he graduated M.B., C.M. in 1888, gaining two bronze medals. He proceeded to the M.D. in 1905. After graduation he acted as an assistant in a practice at Ellon, Aberdeenshire, and later practised at Chatham. He settled at Cromer in 1909 and soon acquired a large practice and gained the esteem of all who knew him, a regard which was clearly shown in 1926, the year in which he retired from practice, by the handsome presentation made to him by friends and patients. During the first world war he was awarded the honorary mention medal of the British Red Cross Society for his work among patients—civilian and military—and for his efforts on behalf of Red Cross hospitals. After the outbreak of the second world war in 1939 he came out of retirement to help colleagues who were short-handed, particularly at Kelling Sanatorium, Holt. Dr. Grant was a widower, his wife having died in 1909, and his only son was killed in an accident in Switzerland in 1923. He is survived by his only daughter, who is midwife-superintendent at Lambeth Hospital.

# Medical Notes in Parliament

### Decline in Welfare Foods

Supplementary Estimates for the Ministry of Health provided the opportunity for brief glimpses at the fall in consumption of welfare foods, and the increase in dentists' remuneration, on July 12.

On the first, for £2,295,000, Mr. IAIN MACLEOD explained that it arose out of the transfer to the Ministry of Health of food hygiene functions from July 6 and responsibility for welfare foods from October 1. Financially the food hygiene transfer was a minor matter. On the welfare food side the estimate was misleading—partly because the transfer would operate from October 1, and partly because large sums had already been voted to the Ministry of Food and could be appropriated. In a full year the amount was something over £30m., and therefore a formidable addition to the responsibilities of the Ministry of Health.

The Government regarded welfare foods as a most important part of the social services. Comparing July–December, 1954, with the same period in 1953, the consumption of national milk fell by 8%, cod-liver oil by 14%, orange juice by 13%, and vitamin tablets by 20%. In the first quarter of this year the trend had continued to some extent with dried milk and orange juice, but there had been a rising tendency with cod-liver oil and vitamin tablets. These trends seemed to be level throughout the country. He suggested that the figures gave cause for considerable thought, but not necessarily for concern. The drop in national dried milk might merely mark a turn towards some of the proprietary brands; the demand for orange juice was affected by the availability of fresh fruit; and there were many sources of vitamin D other than cod-liver oil. Part of the drop might be due to the different siting of places where the foods were available since the local food offices were closed; sometimes the hours when health centres and clinics were open were not so convenient as before. Local health authorities knew the mothers and the families whose diets might be deficient, and he was sure they would play their part in seeing that the full benefit was obtained from this important part of the social services.

### Inquiry Promised

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) said that figures from the L.C.C. and Liverpool suggested that there had been a considerable decline in consumption. The Minister should arrange a careful spot check to secure more information about the causes. Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) said they must look with anxious eyes on any fall in the use of welfare foods. During the war the Ministry of Food spent a great deal on advertising this service. Had the Minister of Health in mind how he could bring its importance to the notice of the public? The House should be given an assurance that it would be looked upon as at least as important as the curative aspects of the Health Service. Mr. V. COLLINS (Shoreditch and Finsbury, Lab.) said that investigations he had made in the two boroughs showed the percentage drop to be much greater than the national trend. A survey, showing the kind of areas where the drop was greatest and where least, was an urgent necessity.

Mr. MACLEOD accepted that there should be a special inquiry so that they might be satisfied about the reasons for the decline. He had intended to do that anyway, and he would undertake to put it in hand. M.P.s might also help; a few minutes' conversation with local medical officers of health and health visitors might produce some leads to the true position, for which he would be grateful.

### Dentists' Remuneration

The second Supplementary Estimate (of £3,007,000) Mr. MACLEOD described as a natural consequence of the

restoration of the 10% cut in dentists' remuneration made in 1950. This increase was an interim measure while he worked out the new scale. Under the new arrangement the average dentists would receive, including the Exchequer superannuation contribution, about £2,000 net. That compared with the general practitioners' average of rather more than £2,200. It was calculated that single-handed dentists working without assistance, in the 35–54-year-old age groups, would receive rather more than £2,400 net. In a full year the 10% restoration would cost £3,500,000 for England and Wales.

Mr. BLENKINSOP regretted that the opportunity did not seem to have been taken of a more thorough review, and to see whether it was possible to get on to a basis of sessional payment or something similar for conservative treatment, which all were anxious to encourage. There was a rather alarming decline in the number of dentists in practice, and the expectation of a much more serious decline in the next few years.

Mr. MACLEOD said that there was no easy answer to the question of recruitment; it by no means turned entirely on remuneration, and in his opinion was closely linked with matters of status.

Both the Supplementary Estimates were agreed to.

### Vole Vaccine Inoculations

Mr. JOHN RANKIN (Glasgow, Govan, Lab.) asked the Secretary of State for Scotland how many of the children living at Bridge of Weir Orphan Home who were inoculated with vole vaccine showed any skin effects in the third year after the inoculation. Mr. J. STUART stated on July 12 that four out of the smaller group of children inoculated in October, 1952, showed late skin reactions, strictly limited to the site of inoculation, in the third year after inoculation. This was in addition to the 20 children out of the group inoculated in October, 1951.

### Export of Monkeys

Mr. A. DODDS-PARKER, Under Secretary for Commonwealth Relations, stated in reply to Mr. S. P. VIANT (Willesden, West, Lab.) on July 15 that under the export licensing procedure introduced by the Government of India in March, 1955, the United Kingdom organizations concerned have sufficient Indian export licences for monkeys to meet their present needs for poliomyelitis research, and have obtained assurances of licences to cover their 1955 research programmes for the production and testing of poliomyelitis vaccine.

### Hospital Pay-beds

Mr. S. HASTINGS (Barking, Lab.) asked the Minister of Health on July 14 what percentage of the total beds were allocated for section 5 paying patients in teaching and other hospitals, respectively, during each of the last five years. Mr. MACLEOD'S reply took the form of the following table, which, he said, expressed the number of beds designated under section 5 of the Health Service Act, 1946, as a percentage of the total bed complement in each case (excluding beds shut owing to lack of staff):

| | Dec. 31 1950 | Dec. 31 1951 | Dec. 31 1952 | Dec. 31 1953 | Dec. 31 1954 |
|---|---|---|---|---|---|
| Teaching hospitals | 7.29 | 6.56 | 6.19 | 6.12 | 6.06 |
| Non-teaching hospitals | 1.10 | 1.02 | 0.99 | 0.97 | 0.96 |

### Mentally Defective Children

Mr. NORMAN PANNELL (Liverpool, Kirkdale, Con.) asked the Minister of Health what steps were being taken to deal with the large number of mentally defective children for whom there was no available accommodation in institutions under the control of his department. Mr. MACLEOD, replying on July 11, said that local health authorities provided supervision, occupation, and training for children outside the hospitals, within the limits of the children's capabilities and the authorities' resources. As regards plans for more hospital beds, proposals so far approved included some 7,000 additional beds for mental defectives of all ages.

Mr. PANNELL said that in Liverpool alone there were 54 low-grade mentally defective children awaiting accommodation. Would the Minister be prepared to consider interim measures to relieve the strain on parents, pending the provision of permanent accommodation? Mr. MACLEOD said he had been doing that. The figures for the Liverpool region had gone down each year for the past three years, and a major part of the new building programme was being done deliberately in that region. Apart from that, the major measure was the plan to enable children to be taken away for short-term care. That was of great value in easing the strain on mothers.

### Visits to Children in Hospital

Brigadier O. L. PRIOR-PALMER (Worthing, Con.) asked the Minister of Health for a further statement on the effect of the Minister's circular to hospitals encouraging daily visits to children's wards. Mr. MACLEOD said that he was gratified at the progress which had been, and was being, made. He had asked the Standing Medical Advisory Committee to consider whether there was any further advice which might usefully be offered to hospitals that had not yet felt able to introduce daily visiting of children. Brigadier PRIOR-PALMER asked that the chief opponents, who he said were the sisters and nursing staff and not the doctors, might be informed that they did not see the damage which took place, but the parents did afterwards. Mr. MACLEOD said that was the point that the advisory committee was considering, and he thought they had accepted it in principle. He stated that in 1952 fewer than 25% of hospitals allowed daily visiting of children. At the end of last year the number was 62½%, and he was told there had been considerable improvement since.

### Group Practice Loans

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked what were the total number of applications for loans by general practitioners wishing to develop group practices, at the latest available date; and how many of these applications have been granted. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, told him that by the middle of July this year 160 applications for loans from the Group Practice Loans Fund had been received. Of these, 61 applications had already been approved. Mr. BLENKINSOP asked if anything could be done to accelerate those that were being considered, and so encourage group practice. Miss HORNSBY-SMITH said that some had been rejected. The delay was not so much in the initial investigation, but when they had been approved it sometimes took time for the conditions covering the loans to be fulfilled.

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*Unfit for Service.*—Some 47,000 men were found medically unfit for National Service in the year 1954; this is 19.5% of the total number examined.

*Building Accidents.*—During 1954 there were 172 fatal and 13,731 non-fatal accidents in building operations.

*Guillebaud Report.*—The Minister of Health understands that the Guillebaud Committee's report may be ready by the late autumn. It will be published as soon as possible thereafter.

*Air Pollution Bill.*—The preparation of the Government's proposals for legislation on air pollution is well advanced.

*Dental Treatment.*—The National Assistance Board made payments to cover charges for dental treatment and the provision of dentures amounting to £236,000 in 1953, £234,000 in 1954, and £56,000 for the first quarter of this year.

# Medico-Legal

## SURGEON RESPONSIBLE FOR SWABS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On July 14, 1955,[1] the Court of Appeal gave judgment dismissing the appeal of Mr. Immanuel Bierer, gynaecological surgeon, of London, from a judgment of Mr. Justice Pearson.[2] Mr. Justice Pearson had awarded a total of £4,416 damages for negligence against Mr. Bierer and the Harley Street Nursing Home Limited, of Weymouth Street, London, W.1, in equal shares as a result of a swab or pack being left in the body of Mrs. Ellen Barbara Joan Urry after an operation for the delivery of a child by caesarean section on January 7, 1953. The issue before the Court of Appeal was whether the surgeon or the theatre sister was ultimately responsible for the removal of the swabs.

In his judgment Lord Justice Singleton said that when a judge was called upon to try an issue involving negligence his duty was the same whether the claim was brought against a surgeon or any other professional man or anyone else. He had to make up his mind on the evidence called before him, deciding what part of it he accepted and whether the case put forward was proved. It was no part of his duty to tell surgeons how to perform their duties.

In this case the surgical packs, each about 10 in. (25 cm.) square, were provided by the home, furnished with tapes as a help towards finding and removal, and counted by the theatre sister before and after use. The sister and the nursing-home had admitted that the count was wrong. Mr. Bierer had not used the tapes. The question was, Had Mr. Bierer failed in his duty?

Although the evidence of other surgeons had been that not to make use of the tapes was not by itself negligent, a surgeon who disregarded them placed an additional burden on himself. As Lord Goddard had said in *Mahon* v. *Osborne*,[3] nothing could be more disastrous to the community than to leave it to a jury or a judge to lay down what it is proper to do in any particular case without the guidance of witnesses who are qualified to speak on the subject. But if it was the task of the surgeon to put swabs in it was his task to take them out, and if the evidence was that he had not used a reasonable standard of care he could not absolve himself by saying, "I relied on the nurse."

In this case Mr. Bierer said he looked, and would have expected to feel a pack in the position in which the pack was left, and was satisfied no pack was there or he would not have stitched up. By not availing himself of the tapes he deprived himself of an additional precaution. He was uncertain if he had placed two or three packs on or alongside the uterus. The patient was entitled to expect the surgeon to do what was reasonable to ensure that the packs were removed before asking the sister if the count was correct. The count was an additional check, and its occasional failure emphasized the need for diligence on the surgeon's part.

Lord Justice Hodson said that Mr. Bierer had fallen far short of the standard of care required of him, and was equally responsible with the sister. He had insisted that he was entitled to rely on the sister's count, and his technique did not include any particular effort to remember or have himself reminded of the location of particular packs although he was not using tapes.

Lord Justice Morris gave a concurring judgment and the appeal was accordingly dismissed. Responsibility of the accident was thus left where it had been placed by Mr. Justice Pearson, on the surgeon and the nursing-home through its servant, the theatre sister, in equal shares.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Mr. Bierer.

[1] *The Times*, July 15, 1955.
[2] *British Medical Journal*, March 26, 1955.
[3] [1939] 2 K.B. 14.

# Universities and Colleges

## UNIVERSITY OF OXFORD

Dr. A. C. Allison has been elected to an Official Studentship at Christ Church.

## UNIVERSITY OF CAMBRIDGE

Professor V. B. Wigglesworth has been re-elected into the Quick Professorship of Biology for a period of three years ending September 30, 1958.

Dr. J. D. Lever has been appointed a University Lecturer in the Department of Anatomy; Dr. P. J. Randle a University Lecturer in the Department of Biochemistry; and Dr. H. F. Grundy has been reappointed a University Demonstrator in the Department of Pharmacology with tenure from January 1, 1956, for two years.

The following candidates have been approved at the examinations indicated:

FINAL M.B.—*Part II*: [3]C. U. Abengowe, [1 2 3]D. M. Ackery, [1]D. P. Addy, [1 2 3]Mrs. E. D. Alberman, [1 2 3]E. M. Allen, [1 2 3]R. G. Anderson, [1 2 3]B. S. Ashby, [1 2 3]N. K. Ashurst, [1 2 3]D. H. Ball, [1 2 3]C. N. Barnes, [1 2]J. F. Baron, [1 3]J. R. Batchelor, [1 2]R. W. Beard, [2]R. B. Bennet, [1 2 3]J. W. Bennett, [1 2]M. S. Bethell, [1 2 3]J. S. Bevan, [1 2 3]R. K. Blach, [2]J. R. Blatch, [1 2 3]D. J. Blomley, [1 3]P. G. A. Bloomer, [1 2 3]A. H. Bottomley, [1]A. E. Boyo, [3]M. M. Brain, [1 2 3]E. C. Bramwell, [1 2 3]A. Bromley, [1 2 3]J. M. G. M. Brookes, [1 2 3]J. Brothwood, [1]I. F. M. Buchanan, [1 3]R. M. Buckle, [1 2 3]K. M. Burkill, [1 2]N. L. Burrell, [2]N. R. Burt, [3]H. C. I. Bywater, [1 2]D. S. Carmichael, [1 3]J. D. Charters, [1 2 3]D. R. Childs, [1 2 3]J. C. T. Church, [1]J. H. Clark, [3]J. R. Cobbett, [1 2 3]R. H. L. Cole, [3]F. G. Cooper, [1 2]M. N. Cox, [2 3]J. P. Crewdson, [1 2 3]J. B. Crowe, [1 2 3]E. W. G. Davies, [1]H. J. Davies, [2]J. E. Davies, [1 2 3]M. J. R. Dawkins, [2 3]P. A. Dinkel, [1 2 3]J. Dominian, [1 2 3]C. J. Drouet, [1 2 3]D. A. Earnshaw, [1 2 3]Mrs. G. J. Earnshaw, [1 3]J. H. Eckersley, [1]J. A. Eddington, [1 2 3]D. Emerson, [1 3]D. J. Fairclough, [1 2 3]R. E. Farmer, [1 2 3]M. G. P. Fisher, [1 3]A. G. Fraser, [1]J. F. Garner, [1 2 3]P. C. Gautier-Smith, [1]C. G. Geary, [1 2 3]P. M. S. Gillam, [1 2 3]K. P. Goldman, [3]J. V. Gosling, [1]I. P. Grant-Whyte, [1 2 3]A. J. Haines, [1]C. D. M. Hamilton, [1 2 3]A. Haworth, [2 3]R. C. Hayball, [1 2 3]D. C. Heap, [1 2 3]C. F. Herridge, [1 2]M. H. Heycock, [1 2 3]W. M. Hollyhock, [2]A. J. Hosking, [1 2]P. J. E. Hubbard, [1 3]R. E. Hudson, [3]C. J. B. Hundleby, [1 2 3]O. Q. Hyder, [1 2 3]J. Insley, [1 3]J. D. Jenkins, [2 3]G. J. Jewell, [1 2 3]H. H. John, [1 2 3]R. D. Jones, [1 2 3]W. R. Keatinge, [1 3]J. F. H. Keighley, [1 2 3]J. H. Kelsey, [1 2 3]M. G. Kemp, [2 3]D. King-Price, [1 3]H. W. Kirkpatrick, [1 2 3]J. P. Knowles [1 2 3]W. Leach, [1]J. H. L. Lloyd-Thomas, [1 3]F. E. Loeffler, [1 2 3]D. E. Longden, [1]J. D. McCaldin, [1 2 3]D. J. McGuigan, [1 2 3]W. J. E. McKee, [1 3]A. S. Mackenzie, [1 2 3]W. S. S. Maclay, [1 2 3]F. B. Mann, [1 2]J. F. Marsden, [1 3]J. J. Mather, [1 3]W. O. Mavor, [1 2 3]V. Mercer, [1 2 3]J. R. M. Millar, [1 2 3]A. B. Miller, [1 3]D. L. Miller, [1]J. B. B. Milne, [3]D. J. Moorhouse, [1 3]A. M. Morgan, [1 2 3]R. Moulton, [2 3]D. H. Murphy, [1 2 3]R. E. Nagle, [1 2]J. F. M. Newman, [1 2 3]E. M. I. Nobel, [2 3]K. E. A. Norbury, [1]R. E. Nottidge, [1 2 3]W. B. Obank, [1 2 3]J. L. O'Sullivan, [2 3]M. A. Pallister, [1 2 3]D. J. Palmer, [1 3]Mrs. K. M. Parry, [3]H. W. Parry-Williams, [2]G. W. Peacock, [2]H. J. Pegg, [1 2 3]F. A. Perera, [1 3]G. M. Petrie, [1 3]B. S. Phillips, [1 2 3]G. W. Phipps, [1 2 3]J. H. L. Playfair, [1 2 3]R. H. Pont, [1 2]A. W. Prentice, [1 2 3]S. Priestman, [1 2 3]D. Read, [2]M. B. Reddington, [1 2 3]M. Ridley, [1 2 3]P. V. Rycroft, [1 2 3]M. E. R. Samson, [1 2 3]D. W. I. M. Sandilands, [2]A. D. Scott, [3]P. H. Scott, [1 2 3]S. Shaldon, [2]A. J. Shaw, [1 2 3]F. D. P. Shaw, [2 3]D. E. Side, [1 2 3]R. Smith, [1 2 3]M. Spiro, [1 2 3]D. A. Strong, [1 3]A. G. Strube, [1 2 3]J. L. Struthers, [2 3]F. Summers, [3]S. G. Sutton, [1 3]J. A. Tait, [1 2 3]K. W. Taylor, [1 2 3]J. M. Tellwright, [2]D. A. Thomas, [2 3]S. H. Thomas, [2 3]C. B. Thomson, [1 2 3]M. W. Tisdall, [2 3]D. G. Twyman, [1 2 3]J. Vinnicombe, [1 3]M. A. M. von Bergen, [1 2 3]D. M. Watney, [3]R. V. F. Williams, [1 2 3]K. M. Wilson, [1 2 3]J. E. Woodyard, [1 2 3]C. C. Zilahi. *Part I (Pathology and Pharmacology)*: R. T. Barnie-Adshead, R. W. Beard, P. G. A. Bloomer, A. E. Boyo, R. Carlisle, J. D. Charters, M. N. Cox, A. G. Dawrant, J. A. Eddington, T. H. English, T. A. Fox, J. F. Garner, C. D. M. Hamilton, R. C. Hayball, W. M. Hollyhock, P. J. E. Hubbard, O. Q. Hyder, R. C. M. Kew, D. King-Price, W. Leach, J. H. L. Lloyd-Thomas, F. B. Mann, D. J. Moorhouse, A. M. Morgan, J. F. M. Newman, M. A. Pallister, E. H. O. Parry, G. M. Petrie, G. W. Phipps, R. H. Pont, N. B. Pride, D. Read, M. B. Reddington, J. D. M. Richards, P. V. Rycroft, M. E. R. Samson, A. H. Sears, F. D. P. Shaw, M. P. Sherwood, J. K. Skinner, G. W. T. Smith, M. J. V. Smith, J. A. Tait, K. W. Taylor, D. M. Watney, M. G. Williams, M. T. C. Wright.

[1]Passed in principles and practice of physic. [2]Passed in principles and practice of surgery. [3]Passed in midwifery and gynaecology.

## UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been approved at the examinations indicated:

M.D.—Margaret K. B. Knox, H. McVey, H. G. Nelson, A. T. F. ffrench-O'Carroll, R. J. Weir.
M.CH.—J. W. Jackson.

## UNIVERSITY OF LONDON

Dr. N. A. Thorne has been appointed Bedell of Convocation for the year beginning February 1, 1955.

Dr. C. E. Newman has been nominated for reappointment as representative of the University on the governing body of West London Hospital Medical School.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Institute of*

*Neurology*, Dr. William Gooddy (Medicine (Neurology)). *Guy's Hospital Medical School*, Dr. M. J. F. McArdle (Medicine (Neurology)). *Postgraduate Medical School of London*, Dr. P. L. Mollison (Medicine). *University College Hospital Medical School*, Dr. A. G. Spencer (Medicine). R. R. Stephens, B.D.S., M.R.C.S., L.R.C.P., has been granted probationary recognition as a teacher of dental surgery (children's dentistry) at the Institute of Dental Surgery for two years from May, 1955.

The Mary Scharlieb Research Studentship, which was awarded to Dr. Katharine M. Dormandy for 1954–5, has been renewed for 1955–6.

## ROYAL COLLEGE OF SURGEONS OF ENGLAND

The Medical Directors-General of the Army and the Royal Air Force attended a meeting of the Council of the Royal College of Surgeons of England on June 9, when the President, Sir Harry Platt, was in the chair, and presented medals for meritorious work in the medical field, the Mitchiner Medal to Colonel W. R. M. Drew, late R.A.M.C., for his distinguished contributions to medicine in the Army, with special relation to the teaching of tropical medicine, and the Lady Cade Medal to Squadron Leader P. Howard for his experimental work in the development of partial pressure suits and pressure breathing equipment.

The Begley Prize was presented to Malcolm Swann (Westminster Medical School).

The following were co-opted to the Council for the year 1955–6, representing various branches of practice: *General Practice*, Dr. O. C. Carter; *Ophthalmology*, Mr. A. B. Nutt; *Radiology*, Dr. E. Rohan Williams; *Otolaryngology*, Mr. Myles L. Formby; *Anaesthetics*, Dr. Frankis T. Evans.

Professor F. C. Wilkinson was invited to act as the representative of dental surgery on the Council.

Diplomas of Fellowship of the College were granted as follows:

A. B. McGrigor, I. L. Gregory, Peggy K. L. Orton, Cecilie Greig, D. A. Watson, R. W. A. Bottoms, G. Hadfield, G. S. Plaut, P. K. Pybus, J. Humphreys, A. Gol, A. E. Richardson, K. R. J. de Belder, J. E. H. Pendower, G. H. Jantet, L. Friedmann, R. H. Baird, J. C. B. Serjeant, N. E. Brand, E. V. Peipman, W. A. Baker, M. K. Guha Thakurta, F. J. Hedden, E. W Parry, M. M. Chawla, T. J. Thwaite, A. H. Toyne, Betsy Brown, G. P. Debenham, H. Gaylis, N. A. A. Myers, S. D. Broacha, H. H. Chesterfield-Evans, C. I. Phillips, B. Bhattacharyya, B. L. Cornish, K. Cronin, J. Jacob, M. L. H. Lee, H. G. Lowe, G. D. H. Shawe, L. Simon, N. V. Addison, T. J. Claffey, C. N. d'E. Eastes, F. Ellis, W. F. Gordon, B. Ho, W. M. Keynes, J. P. Maddern, P. F. Mountfort, J. K. Oyston, H. Piggott, D. R. Richard, T. M. Robinson, W. G. Taylor, G. D. Tracy, H. T. G. Williams, G. S. M. Botha, D. J. Brain, J. A. C. Brown, R. C. Chakravorty, D. A. Cooper, J. B. Doss, M. S. El-Din Ed-Dars, W. B. Fleming, P. A. Freeman, S. B. Joshi, R. H. Kernutt, J. A. Loeb, I. L. McVey, S. N. B. Roy, C. G. Tulloh, R. G. Williams, K. P. Abel, S. M. A. Alhady, J. G. Corson, D. O. Cropley, J. A. Myburgh, N. R. Patel, G. J. Schnitzler, S. R. Shar, W. W. Slack, V. H. Smith, A. B. Vivian, A. F. Wallace, D. W. Warren, D. G. Failes, J. F. H. Graff, A. Jessup, C. Shaldon, D. D. Arnold, J. N. Joshipura.

Diplomas of Membership were granted to B. M. G. Clarke, A. Gibbons, and Janet Goodall.

Diplomas were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—N. H. Aldridge, L. J. du Preez, D. Edwards, Shirley E. Entrican, W. C. Heron, K. S. Huque, Catherine V. Krafft, Omar Bin Din, W. M. O. Purcell, A. Rattarangsi, M. J. Ryan, M. M. Schechter, J. P. Sinha, G. C. Stavrakis.

DIPLOMA IN MEDICAL RADIOTHERAPY.—H. D. Batt, P. E. Bodkin, T. B. Brewin, J. C. Courtney, Hazel E. Davidson, Hung Chiu Ho, Y. Nasrallah, I. M. Shulman, A. J. Ward.

DIPLOMA IN PATHOLOGY.—L. Bernstock, D. A. Ll. Bowen, M. Levene, L. Michaels, N. E. Rankin, P. D. Roberts, T. P. Telfer, T. A. White.

## ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on May 3, with the President, Sir Stanley Davidson, in the chair, the following were elected Members of the College:

J. M. Johnston, H. R. Harris, T. M. Desai, L. Molk, M. B. Azami, R. H. Aldons, S. K. Mazumdar, D. O. Lewis, D. A. Kerfoot, E. N. A. Magid, J. Richmond, E. Schiller, W. G. Smith, S. S. Levin, E. S. Nash, J. R. Shah, B. C. Syam, I. J. Pinto, R. C. Parikh, N. H. Brooke, S. C. Jain, B. Cowan, R. H. C. Rischbieth, W. H. Wolfenden, J. C. Pond, M. Wakefield, G. D. Campbell, B. C. Paton, M. A. Kibel.

## ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

The following, having satisfied the Board of Censors in Australia, were admitted to Membership by the President in May:

D. T. Church, B. D. Cotton, A. W. T. Edwards, D. A. Ferguson, R. A. B. Holland, R. G. Lewis, D. C. Maddison, R. S. Packard, R. D. Spooner, and Claire Weekes, of New South Wales; P. Ebeling, K. F. Fairley, W. S. C. Hare, K. H. McLean, B. W. Neal, and J. S. Penington, of Victoria; T. M. Ferrier, of Queensland.

The following, having satisfied the Board of Censors in New Zealand, were admitted to Membership *in absentia* by the President in May:

W. M. W. Brookfield, R. H. Culpan, P. W. Dykes, G. F. Hall, R. W. Hornabrook, J. D. McCreanor, J. R. Presland, D. H. H. Pullon, F. T. Shannon, C. M. Stubbs, J. M. Tweed, M. H. Watson, and R. D. Wigley.

# INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **July 2** (No. 26) and corresponding week 1954.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

| CASES In Countries and London | 1955 | | | | | 1954 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eng. & Wales | Lond. | Scot. | N. Ire. | Eire | Eng. & Wales | Lond. | Scot. | N. Ire. | Eire |
| Diphtheria | 6 | 0 | 1 | 0 | | 20 | 0 | 5 | 0 | 1 |
| Dysentery | 807 | 47 | 298 | 7 | | 661 | 85 | 199 | 3 | |
| Encephalitis, acute | 3 | 1 | | 0 | | 6 | 0 | 0 | | |
| Enteric fever: | | | | | | | | | | |
| Typhoid | 5 | 0 | 1 | 0 | | 4 | 1 | 0 | 2 | |
| Paratyphoid | 17 | 0 | 0 | 0 | | 3 | 0 | 2 | 0 | |
| Food-poisoning | 327 | 36 | | 0 | | 217 | 34 | | 8 | |
| Infective enteritis or diarrhoea under 2 years | | | | 11 | 21 | | | | 11 | 21 |
| Measles* | 17,716 | 342 | 138 | 177 | 417 | 3,085 | 94 | 117 | 217 | 403 |
| Meningococcal infection | 23 | 1 | 7 | 0 | 1 | 29 | 2 | 8 | 0 | 4 |
| Ophthalmia neonatorum | 41 | 3 | 9 | 0 | | 45 | 1 | 4 | 0 | |
| Pneumonia† | 295 | 16 | 139 | 7 | | 293 | 26 | 119 | 0 | 2 |
| Poliomyelitis, acute: | | | | | | | | | | |
| Paralytic | 47 | 9 | 6 | 0 | | 35 | 3 | 11 | 4 | |
| Non-paralytic | 26 | 5 | | | | 19 | 1 | | | |
| Puerperal fever§ | 230 | 49 | 12 | 1 | | 243 | 31 | 1 | 2 | 1 |
| Scarlet fever | 585 | 43 | 86 | 39 | 13 | 741 | 58 | 124 | 20 | 27 |
| Tuberculosis: | | | | | | | | | | |
| Respiratory | 743 | 88 | 139 | 31 | | 744 | 75 | 185 | 18 | |
| Non-respiratory | 133 | 5 | 33 | 2 | | 126 | 1 | 28 | 6 | |
| Whooping-cough | 1,833 | 91 | 97 | 62 | 52 | 2,211 | 84 | 200 | 19 | 42 |

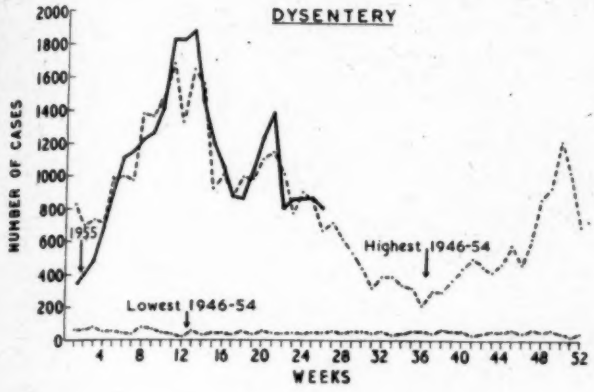
| DEATHS In Great Towns | 1955 | | | | | 1954 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eng. & Wales | Lond. | Scot. | N. Ire. | Eire | Eng. & Wales | Lond. | Scot. | N. Ire. | Eire |
| Diphtheria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dysentery | 1 | 1 | | 0 | | 0 | 0 | | 0 | |
| Encephalitis, acute | | 0 | | | 0 | | 1 | | | 0 |
| Enteric fever | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | |
| Infective enteritis or diarrhoea under 2 years | 5 | 0 | 0 | 0 | 0 | 8 | 2 | 0 | 0 | 0 |
| Influenza | 3 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| Measles | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Meningococcal infection | | 0 | 0 | | | | 0 | 0 | | |
| Pneumonia | 143 | 17 | 15 | 12 | 2 | 143 | 17 | 15 | 8 | 4 |
| Poliomyelitis, acute | 1 | 1 | | | 0 | 1 | 0 | | | 0 |
| Scarlet fever | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Tuberculosis: | | | | | | | | | | |
| Respiratory | 47 | 3 | 2 | 3 | 6 | 77 | 12 | 15 | 3 | 2 |
| Non-respiratory | | 1 | 0 | 0 | 0 | | 3 | 16 | 1 | 1 |
| Whooping-cough | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Deaths 0–1 year | 191 | 21 | 25 | 10 | 6 | 202 | 20 | 21 | 5 | 7 |
| Deaths (excluding stillbirths) | 4,433 | 640 | 512 | 114 | 109 | 4,574 | 615 | 493 | 94 | 135 |
| LIVE BIRTHS | 7,650 | 1097 | 881 | 237 | 426 | 7,876 | 1181 | 888 | 217 | 461 |
| STILLBIRTHS | 209 | 28 | 13 | | | 184 | 23 | 24 | | |

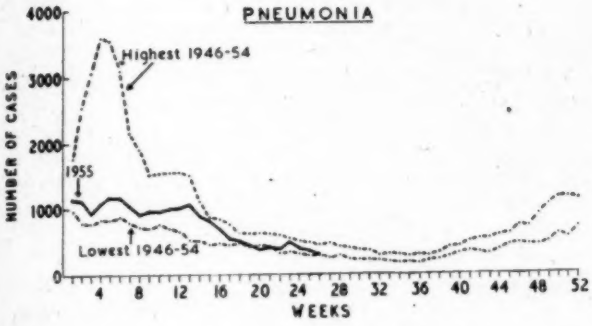
* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

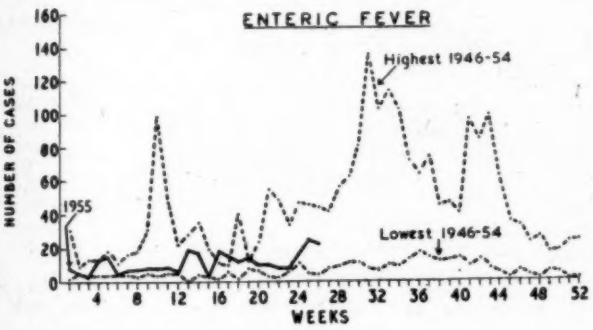
# Vital Statistics

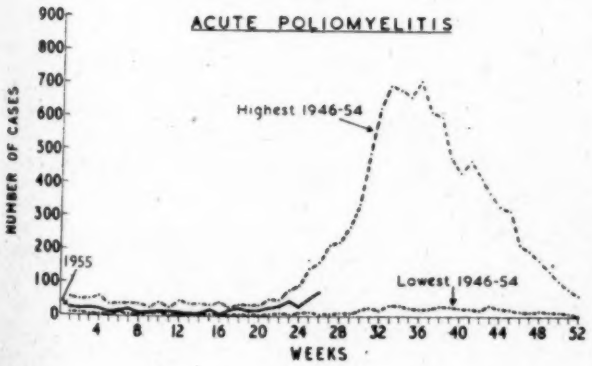
### Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946–54 are shown thus - - - - - -, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.




### Infectious Diseases

The fluctuations in the trends of infectious diseases in England and Wales during the week ending July 2 included falls in the notifications by 2,799 for measles, from 20,515 to 17,716, and 55 for dysentery, from 862 to 807, and rises by 44 for scarlet fever, from 541 to 585, and 10 for whooping-cough, from 1,823 to 1,833.

The largest falls in the incidence of measles were 298 in Yorkshire West Riding, from 1,171 to 873, 293 in Southampton county, from 1,260 to 967, 287 in Glamorganshire, from 1,343 to 1,056, 263 in Middlesex, from 1,062 to 799, 231 in Essex, from 934 to 703, 226 in Surrey, from 716 to 490, and the only large rise was 132 in Kent, from 1,100 to 1,232. The only large rise in the returns for scarlet fever was 44 in Lincolnshire, from 9 to 53, due to an outbreak in Bourne U.D., where 35 cases were notified. The largest variations in the trends of whooping-cough were a fall of 91 in Kent, from 158 to 67, and a rise of 53 in Lancashire, from 217 to 270. 6 cases of diphtheria were notified, being 12 fewer than in the preceding week.

73 cases of acute poliomyelitis were notified, and these were 13 more for paralytic and 6 more for non-paralytic cases than in the preceding week. The cases were mainly concentrated in three counties, Yorkshire West Riding 27 (Barnsley C.B. 11, Leeds C.B. 4, Dewsbury C.B. 3), London 14 (Poplar 2, Stepney 2), and Lancashire 9 (Barrow-in-Furness C.B. 3, Liverpool C.B. 4).

The largest returns of dysentery were Lancashire 227 (Liverpool C.B. 69, Blackpool C.B. 27, Middleton M.B. 25, Blackburn C.B. 18, Manchester C.B. 17), Yorkshire West Riding 100 (Huddersfield C.B. 44, Leeds C.B. 25, Sheffield C.B. 11), Durham 64 (Barnard Castle R.D. 30, Stanley U.D. 10), London 47 (Islington 12), Cheshire 46 (Dukinfield M.B. 21, Wallasey C.B. 20), Northumberland 39 (Newburn U.D. 14, Seaton Valley U.D. 11), Surrey 35 (Croydon C.B. 31), Glamorganshire 25 (Swansea C.B. 13), Yorkshire North Riding 25 (Middlesbrough C.B. 15, Whitby U.D. 10), Middlesex 21.

The largest reported outbreaks of food-poisoning were in Lancashire, where 53 cases were notified in Liverpool C.B. and 36 cases in Westhoughton U.D.

### Week Ending July 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 556, whooping-cough 1,865, diphtheria 10, measles 18,375, acute pneumonia 236, acute poliomyelitis 99, dysentery 590, paratyphoid fever 17, and typhoid fever 8.

# The Services

Brigadier H. Ll. G. Hughes, C.B.E., D.S.O., M.C., Army Emergency Reserve of Officers, has been appointed Honorary Colonel of an A.E.R. Unit.

A *Supplement* to the *London Gazette* has announced the following awards:

*First Clasp to the Army Emergency Reserve Decoration.*—Major R. H. Berry, R.A.M.C. (now T.A.).

*Third Clasp to the Territorial Efficiency Decoration.*—Colonel J. R. McDonald, M.C., T.D. (now A.E.R.).

*First Clasp to the Territorial Efficiency Decoration.*—Major F. E. D. Griffiths, T.D., R.A.M.C.

*Territorial Efficiency Decoration.*—Colonel A. J. Maciver, O.B.E., Lieutenant-Colonel J. D. Finnegan, Captain (Honorary Major) H. Waters (retired), and Captains T. A. Blyton (retired) and G. J. Partington (retired), R.A.M.C.

Air Commodore D. A. Wilson, A.F.C., R.A.F., has been appointed Honorary Surgeon to the Queen in succession to Air Vice-Marshal E. D. D. Dickson, C.B., C.B.E., R.A.F., who has vacated the appointment on retirement from the R.A.F.

Group Captain G. L. M. McElligott, R.A.F.V.R., and Flight Lieutenant F. J. G. Jefferiss, R.A.F.V.R., have been awarded Air Efficiency Awards.

# Medical News

**Inquiry into Uganda Medical and Health Services.**—The Governor of Uganda has appointed the following committee to examine the present stage of development of medical and health services in the Protectorate, and to recommend future policy: Professor A. C. FRAZER, professor of pharmacology at Birmingham, chairman; Professor H. J. CROOT, professor of surgery, Makerere College Medical School; Mrs. FLORENCE LUBEGA, member of Makerere College Council; Mr. J. M. MADHVANI, member of Uganda Legislative Council; Dr. I. K. MAJUGO, general medical practitioner; Captain H. M. NAYLOR, chairman, Toro Tea Company; Dr. S. J. SCURLOCK, S.A.M.O., Birmingham Regional Hospital Board; and Dr. CICELY D. WILLIAMS, London School of Tropical Medicine and Hygiene. The committee will commence work about August 22. Interested individuals, bodies, and associations in the Protectorate who wish to place their views before the committee are invited to submit memoranda to the Secretary, Medical Committee, P.O. Box 101, Entebbe.

**New Laboratories for Westminster Hospital Group.**—At the opening of the new Vincent Square Laboratories of the Westminster Hospital on July 12 Professor R. J. V. PULVERTAFT, director of laboratories at the Westminster Hospital, said that the last occasion when a laboratory of the Westminster Hospital had been opened with official ceremony was in 1900, when Lord Lister opened the first laboratory in the old hospital. The Vincent Square Laboratories were the first new buildings to be undertaken by the Westminster Hospital Group since the National Health Service came into being. In describing the laboratories, LORD NATHAN, chairman of the board of governors, said that their purpose was to serve the two near-by hospitals—the Gordon Hospital and the Westminster Children's Hospital—and also All Saints' Hospital, London, both for routine diagnostic work and for research. Before officially opening the doors of the new building, Lord Nathan congratulated Dr. GEORGE LUMB on his appointment as director of the laboratories, and Dr. J. H. WILKINSON the deputy director. Guests attending the opening ceremony were able to see some of the work in progress in the various departments of the laboratory.

**Royal Medico-Psychological Association.**—The association held its 114th annual meeting in Dublin from July 12 to 15, under the presidency of Professor JOHN DUNNE, professor of psychiatry at University College, Dublin. Professor Dunne's presidential address was on "The Mind–Body Relationship," and papers were read on the cephalic post-traumatic syndrome, occupational therapy, geriatrics, and the working of the Eire Mental Treatment Act. At the annual dinner on the 13th, attended by the presidents of the Irish Royal Colleges of Physicians and Surgeons and by the president of University College, the Minister for Health for Eire, Mr. T. F. O'HIGGINS, replied to the toast of "The Guests." Dr. E. T. FREEMAN, P.R.C.P.I., who proposed the toast of "The Royal Medico-Psychological Association," stressed the need for psychiatrists to play a full part in the medical activities of the general hospitals to which they were attached, so that mental medicine might become an integral part of general medicine. On the evening of July 14 the Minister for Health held a State reception for members and their wives at Dublin Castle.

**International Diabetes Federation.**—The second International Congress of the International Diabetes Federation was held at Cambridge from July 4 to 8, under the honorary presidency of Sir LIONEL WHITBY. The congress included both lay and scientific sessions. Among those present were Dr. ELLIOT P. JOSLIN, who delivered the ninth Banting Memorial Lecture of the British Diabetic Association; Dr. R. D. LAWRENCE, president of the Federation; and Professor C. H. BEST, F.R.S. The Congress was attended by 500 members and visitors from 30 different countries.

**Orthopaedic and Accident Services at Stanmore.**—More details about the Accident Service at the Royal National Orthopaedic Hospital, Stanmore (see *Journal*, May 28, p. 1350), were given at a discussion meeting for local general practitioners and industrial medical officers held there on July 8. Mr. H. J. SEDDON, clinical director of the hospital, and Mr. J. N. WILSON, surgeon in charge of the Accident Centre, answered questions. The Centre, consisting of converted twin wards with resuscitation and theatre facilities, will be available for the treatment of all types of injury, both major and minor. After the urgent treatment of the injured, their rehabilitation can be undertaken in the existing physiotherapy and occupational therapy departments of the hospital. In addition orthopaedic clinics to serve the expanding population of the neighbourhood are being started this month at the hospital at Stanmore.

**Royal College of Surgeons.**—At the council meeting on July 14 Professor PAUL SANTY, professor of clinical surgery at Lyons, was admitted to the Honorary Fellowship, and Professor K. F. RUSSELL, associate professor of anatomy at Melbourne, was appointed Thomas Vicary Lecturer for 1955. The Thomas Vicary Lecture is a historical lecture in anatomy or surgery established in 1919 out of funds provided by the Barbers' Company. The award was announced of the Gilbert Blane Medal for 1955, for medical officers in the Royal Navy, to Surgeon Commander W. H. B. ELLIS for his thesis on "Physiological and Psychological Effects of Deck Landing." The establishment of Edward Lumley Research Fellowships in the Royal Australasian College of Surgeons was reported: these fellowships, made possible by a gift of £25,000 by Mr. Lumley to the Australasian College, are to enable young Australian surgeons to study in Britain. Mr. A. LAWRENCE ABEL, Mr. R. H. O. B. ROBINSON, Mr. HAROLD C. EDWARDS, and Dr. FRANKIS EVANS were admitted to the council of the Royal College of Surgeons, and Mr. A. C. H. BELL, representing gynaecology and obstetrics, was co-opted.

**Society of Apothecaries of London.**—At a soirée at Apothecaries' Hall on July 19 the Master, Sir CECIL WAKELEY, conferred the Mastery of Midwifery, *honoris causa*, on Dame HILDA LLOYD and Sir ARTHUR GEMMELL, P.R.C.O.G., and presented the Gold Medal in Therapeutics to Sir RUSSELL BROCK.

**Hughlings Jackson Lecture.**—The Council of the Royal Society of Medicine has appointed Sir GEOFFREY JEFFERSON, F.R.S., Hughlings Jackson lecturer and medallist for 1955. The lecture will be given on March 1, 1956, the subject being "The Neurology of the Trigeminal Nerve."

**Scottish Society of Anaesthetists.**—The following officers have been elected for 1955–6: president, Dr. F. G. GIBBS (Edinburgh); vice-president, Dr. H. BRUCE WILSON (Aberdeen); hon. secretary, Dr. A. G. MILLER (Glasgow). At the annual meeting at the Dunblane Hotel Hydro, Perthshire, April 29 to May 1, Dr. T. CECIL GRAY (Liverpool) was the guest speaker. The prize for the best paper by an anaesthetist of senior registrar grading or below was won by Dr. A. H. B. MASSON (Edinburgh).

**New Journal on Social Psychiatry.**—The first issue of *The International Journal of Social Psychiatry*, described as a "new quarterly of interdisciplinary research," was launched recently at a press conference at the Royal Society of Medicine, presided over by Lord WEBB JOHNSON. The journal is edited jointly by Dr. JOSHUA BIERER, medical director of the Marlborough Day Hospital, London, and Professor THOMAS A. C. RENNIE, professor of social psychiatry at Cornell University Medical College, New York. There is in addition an internationally composed advisory editorial board of 124 members. The scope of the new journal may best be indicated by quoting Professor Rennie's definition of social psychiatry in the opening article of the first issue. "Social psychiatry," he says, "is the study of etiology and dynamics of persons seen in their total environmental setting." *The International Journal of Social Psychiatry* is published quarterly at 7s. 6d. an issue or

25s. for four issues. The corresponding prices in U.S.A., Canada, and South America are $1.50 and $5. The publishers are the Avenue Publishing Company, 9, Fellows Road, London, N.W.3.

**Doctor at Sea.**—The young man who passed his exams so entertainingly in *Doctor in the House* now becomes a ship-surgeon in Richard Gordon's latest film, *Doctor at Sea.* Fleeing the ardent embraces of his principal's daughter, the tyro general practitioner gets a post in a small ship to South America. An eccentric crew, the diffident doctor, and medical comforts provide clean fun on board ship, while the South American port gives plenty of scope for showing that the improper study of mankind is woman. Here we meet the delightful Brigitte Bardot, a new French star—and surely the first to be seen for some time outside an "X" film. Dirk Bogarde as the young doctor is what every layman thinks a young doctor should be, and James Robertson Justice roars with convincing aplomb as the irascible captain of the ship. Romance, humour, and the discovery that some parts of medicine are not in the text-books combine here to give us a tonic without a trace of a bitter taste.

**Monkeys for Poliomyelitis Research.**—A Reuter dispatch from Delhi, dated July 17, states that the Indian Government has agreed to allow exports of monkeys to the United States, Britain, Australia, and Canada for use in the preparation of anti-poliomyelitis vaccine and other medical research. About 200,000 monkeys are expected to be exported during the coming year, more than half of them to the United States.

**Connaught Laboratories, Toronto.**—The University of Toronto announced on July 15 that a new million-dollar laboratory for the production of Salk poliomyelitis vaccine would be added immediately to the Connaught Medical Research Laboratories (*New York Times,* July 16).

**Professor T. N. A. Jeffcoate,** professor of obstetrics and gynaecology at Liverpool, leaves at the end of this month to take up a six-weeks appointment as McIlrath Guest Professor at the Royal Prince Alfred Hospital, Sydney. On his way he will deliver the Sir Arcot Mudaliar lectures at Madras University. After his stay in Australia, Professor Jeffcoate will tour New Zealand, and then go to New York for a month as visiting professor in obstetrics and gynaecology at New York State University. He will be away for about six months.

**Mr. G. W. Taylor,** acting assistant director of the surgical professorial unit at St. Bartholomew's Hospital Medical College, has been appointed to the London University readership in surgery tenable there.

**Dr. Harry Butler,** reader in anatomy at St. Bartholomew's Hospital Medical College, has been appointed to the chair of anatomy in the University College of Khartoum.

**Professor M. L. Rosenheim,** professor of medicine at University College Hospital Medical School, has been appointed a member of the senate of London University in place of Professor R. V. CHRISTIE, who is going to McGill University, Montreal.

## COMING EVENTS

**Institute of Medical Laboratory Technology.**—The seventh triennial conference will be held at Nottingham University on August 27 to September 2. Further details from Mr. GEORGE WHITING, The Priory, Thurgarton, Nottingham.

**Kashmir Medical Congress.**—Arrangements are being made for a party from this country to attend the medical congress in Kashmir on October 12. The approximate cost of £298 per person will include return air fare from London and travelling and living expenses in India for four weeks. Further details may be obtained from Dr. R. U. HINGORANI, 128, Harley Street, London, W.1.

**Sixth International Congress of Otolaryngology** will be held in Washington, D.C., May 5–10, 1957.

## SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

### Wednesday, July 27

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At General Infirmary at Leeds, 8.30 p.m., Dr. D. G. Melrose: Hypothermia.

### Thursday, July 28

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor F. G. Kergin (Toronto): Treatment of Chronic Pleural Empyema.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At St. Francis and Hurstwood Park Hospital, Haywards Heath, Sussex, 7 p.m., clinical meeting. Mr. E. J. Radley Smith: Neuro-surgical Conditions Presenting with Psychiatric Symptoms.

## APPOINTMENTS

LIVERPOOL REGIONAL HOSPITAL BOARD.—G. D. Walker, D.M., M.R.C.P., Whole-time Consultant Physician Superintendent to Newsham General Hospital; D. R. Wallace-Jones, M.B., B.Chir., D.M.R.D., Consultant Radiologist to the North Liverpool and Fazakerley Groups; J. C. Richardson, M.B., Ch.B., F.F.A. R.C.S., D.A., Consultant Anaesthetist for the Liverpool City Area; C. H. Jones, M.B., Ch.B., Whole-time Assistant Pathologist to the Alder Hey Children's Hospital; L. B. Scott, M.B., B.S., F.R.C.S.Ed., Whole-time Assistant Consultant Plastic Surgeon to Whiston Hospital, Alder Hey Children's Hospital, and the Royal Southern Hospital.

MACLEOD, MELVILLE C., M.D., D.P.H., Senior Medical Officer and School Medical Officer, Dorset County Council.

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## BIRTHS, MARRIAGES, AND DEATHS

### BIRTHS

**Daniel.**—On July 11, 1955, at the Jessop Hospital for Women, Sheffield, to Rhianydd, wife of Owen Daniel, F.R.C.S., a son.

**Evans.**—On June 29, 1955, at the Norfolk and Norwich Hospital, to Evelyn, wife of Dr. T. L. Evans, a son—Stephen John.

**Gresham.**—On July 12, 1955, at 47, Eachard Road, Cambridge, to Gwen (formerly Leigh), wife of Dr. G. A. Gresham, a son—Andrew Charles Jolyon.

**Griffiths.**—On July 6, 1955, at Royal Salop Infirmary, Shrewsbury, to Margaret (formerly Hepenstal), wife of Dr. Cary Griffiths, a daughter—Melanie Clare.

### MARRIAGES

**Thomas—Tighe.**—On July 9, 1955, at Sketty Church, Swansea, Lewis Phillip Thomas, F.R.C.S., to Ann Gwendoline Tighe, M.B., B.Ch.

### DEATHS

**Ballantyne.**—On June 12, 1955, at Ashton, Eskbank, Midlothian, Harold Sherman Ballantyne, M.B., F.R.C.P.Ed., D.P.H.

**Barrett.**—On June 8, 1955, at his home, 13, Salisbury Avenue, Goole, Yorks, Kevin O'Mahony Barrett, L.R.C.P.&S.I. & L.M., aged 49.

**Bradford.**—On May 26, 1955, in a nursing-home, St. Leonards-on-Sea, Sussex, Robert George Bradford, M.D., of The Pillars, North Trade Road, Battle, Sussex.

**Carrington.**—On June 6, 1955, at his home, 7, Fairlight Road, Hythe, Kent, George Hedwig Carrington, M.R.C.S., D.P.H.

**Cholmeley.**—On June 2, 1955, in a nursing-home, Montague Adye Cholmeley, M.R.C.S., L.R.C.P., D.P.M., of 29, West Hill, Wandsworth, London, S.W., aged 81.

**Everidge.**—On June 8, 1955, at his home, John Everidge, O.B.E., F.R.C.S., of 7, Wimpole Street, London, W.

**Flenley.**—On June 4, 1955, in hospital, Denis Flenley, M.B., Ch.B., of 9, High Cross Avenue, Poulton-le-Fylde, Lancs, aged 56.

**Gill.**—On June 3, 1955, at Tipton St. John, Devon, George Brittan Gill, T.D., M.B., B.S., F.R.I.P.H.H., formerly of Leicester.

**Greenwood.**—On May 26, 1955, at the Queen Elizabeth Hospital, Birmingham, Frank Redmayne Greenwood, M.D., of 621, Stratford Road, Sparkhill, Birmingham, aged 81.

**Lavelle.**—On May 25, 1955, at 51, Ashbourne Road, Derby, Henry Allman Lavelle, M.B., B.Ch.

**Russell.**—On May 28, 1955, David Russell, M.D., of Fernhill, Dunoon, Argyllshire, formerly of Lisbon, Portugal.

**Scotson.**—On June 6, 1955, in hospital, Kathleen Dorothy Clay Scotson, L.M.S.S.A., of 46, Roscoe Road, Irlam, Manchester, Lancs.

**Upton.**—On June 8, 1955, in York County Hospital, Stanley Upton, M.B., B.S., of 14, St. George's Place, York.

# Any Questions ?

*We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.*

### Side-effects of Stilboestrol

**Q.**—*What are the side-effects of stilboestrol when, for instance, given in prostatic cancer? Is there any effect on bowel action or the heart? Are there any conditions in which stilboestrol therapy is definitely contraindicated?*

**A.**—The side-effects of stilboestrol have been described since the introduction of this substance in 1938. The continued popularity and wide use of the substance would indicate, in the average case at least, that these are not serious. The commonest manifestation varies from slight nausea to actual gastro-intestinal disturbances and, in some cases, vomiting. This is undoubtedly a central effect and is comparable to the vomiting of pregnancy. Persistence with the drug usually leads to a disappearance of the symptoms, and, as the action is central, it is obviously useless to administer the drug in enteric-coated capsules as has sometimes been suggested.

Sore nipples are sometimes complained of in the treatment of carcinoma of the prostate. There is no method of avoiding this, and undue pressure of braces, etc., can be avoided by the use of a belt.

Very rarely transitory cutaneous manifestations have been described in the use of stilboestrol.

There is no known contraindication to the use of stilboestrol in the treatment of carcinoma of the prostate.

### Aerosol Therapy

**Q.**—*What is the present status of aerosol therapy? In what conditions is it indicated?*

**A.**—The term "aerosol therapy" is taken to mean treatment by the inhalation of nebulized solutions. Three groups of drugs may be given in this way: antibacterial drugs, antispasmodics, and substances intended to alter the physical properties of viscid secretions. With all of these uses it should be remembered that substances inhaled as a mist can reach only those air passages through which the inhaled air is flowing, and that the depth in the bronchial tree to which the inhaled particles penetrate depends on their size. Large particles are held up entirely in the upper respiratory tract, while very small particles are not likely to be deposited in therapeutic amount at any level.

Among antibacterial drugs, penicillin is the one most frequently employed. It has the merit of being non-toxic, though its use by inhalation may give rise to sensitization. Its effect can be only on the surface of those bronchi on which it is deposited in therapeutic amounts. In many of the conditions in which it is used—for example, acute exacerbations of bronchitis, it is probable that many of the symptoms arise from small foci of bronchopneumonia. Into these the inhaled mist cannot penetrate. The effect of the inhalation is therefore confined to the surface of the patent bronchi. Moreover, continued application in this way is likely to lead to replacement of the bacterial flora originally present by one resistant to penicillin. On the whole, in respiratory infections, acute or chronic, which require the use of antibacterial drugs, it seems preferable to give these drugs systemically by the appropriate route.

So far as antispasmodics are concerned, the inhalation of a mist of adrenaline or isoprenaline (the preparations of the *National Formulary* are appropriate) is helpful to most patients with asthma or with bronchial spasm secondary to chronic bronchitis and emphysema. In those severely incapacitated patients who find that this method gives symptomatic relief, it is undoubtedly useful; but some physicians doubt the wisdom of using it in patients with less severe asthma, especially in those cases with strong psychological factors, since the patient may become unduly dependent upon his nebulizer, and the too frequent use of the inhaled mist may add to the chronic irritation of the respiratory mucosa.

The inhalation of mists of detergent substances or of proteolytic enzymes is a more recent development. They have been tried in patients with chronic bronchitis and emphysema who are troubled by unduly viscid secretions. The detergents act by reducing surface tension and thus assisting in expulsion of the secretions, while a specially purified preparation of trypsin has been used to liquefy secretions. Unfortunately, the relief afforded by either of these measures is very transient, and while they may therefore be of some value in acute episodes—for example, post-operatively—there does not seem to be much prospect that any of the preparations at present available, given by current methods, can be of much assistance in long-term management.

### Treatment of Ulcerative Colitis

**Q.**—*What recent advances have there been in the treatment of ulcerative colitis?*

**A.**—Ulcerative colitis remains a serious disease with a considerable fatality rate. However, there have been three lines of advance during the last few years. First, a widespread appreciation that when the bloody diarrhoea is severe the patient needs repeated blood transfusion, a high protein diet with vitamin supplements, and care in a hospital equipped to follow changes in the blood chemistry; the last is particularly important, as electrolyte disturbances may be severe, and doubtless have caused many deaths in the past. Secondly, it has been shown that cortisone and A.C.T.H. greatly increase the chance of a patient going into remission.[1] Unfortunately, there is no guarantee that such a remission will be permanent, and further courses of treatment or maintenance therapy may be necessary. Finally, surgery has been widely used, with ileostomy as an essential step, and colectomy either carried out at the same time or performed later if disease persists in the isolated colon. A good account of surgical methods and results will be found in a recent monograph.[2] An important point to realize is that when ileostomy is carried out it will be permanent, for very few patients can later have the continuity of the bowel restored. The present writer regards a permanent ileostomy as an unattractive possession, and is heterodox in not advising it unless there is some grave complication of the acute attack—for example, perforation of the bowel—which is best treated surgically, or unless the disease has become established as a chronic disorder, with the colon severely damaged beyond reasonable hope of recovery.

REFERENCES

[1] Truelove, S. C., and Witts, L. J., *British Medical Journal*, 1954, **2**, 375.
[2] Brooke, B. N., *Ulcerative Colitis*, 1954. Edinburgh and London.

### The Prefix "Nor"

**Q.**—*What is the derivation and precise connotation of the prefix "nor," as in noradrenaline or n-allyl normorphine?*

**A.**—Various compounds, of which adrenaline is one and morphine is another, contain in their structure a nitrogen atom to which a methyl group is attached. When the same compound is prepared minus the methyl group, then the nitrogen atom, N, is without the radicle $-CH_3$, and putting that into German it is "ohne Radikal." So the compound is said to be "Nor," from the first letters of these words. Hence noradrenaline is a substance in which the $-CH_3$ group attached to the nitrogen is replaced by H. And n-allyl normorphine is a substance in which the $-CH_3$ group attached to the nitrogen is replaced by "allyl."

### Copper in Drinking Water

**Q.**—*A sample of water that had lain overnight in a copper communication pipe was found to contain 5 parts per million of copper. Would such a concentration, presumably mainly in the first few gallons drawn off, be likely to cause ill effects after consumption over a period of some months?*

**A.**—No concern need be felt, on the score of wholesomeness, over the presence of traces of copper in a water supply. In fact, it is probable that the small quantities so consumed may be beneficial. A concentration of 5 parts per million of copper in water that has lain overnight in copper pipes is a little high; authorities are agreed that under such conditions the figure should not exceed 3 parts per million. During the day, of course, it would be but a small fraction of this, for the water would be constantly on the move.

However, copper in water has a significance which is not mentioned in the question. Quite small concentrations—considerably less than one part per million—can reduce the life of galvanized iron storage cisterns, aluminium kettles, and the like. An electro-chemical action results from the dissimilar metals and may cause slow erosion of the household equipment.

### Pregnancy and Migraine

**Q.**—*Does pregnancy influence the frequency and severity of migraine? What is the most effective treatment of headache during pregnancy?*

**A.**—Pregnancy influences the frequency and severity of migraine in those patients in whom the migraine is associated either with ovulation or with the premenstrual phase of the menstrual cycle. Such patients constitute a high percentage of female sufferers. In these the attacks entirely cease either immediately after conception or, at the worst, by the end of the first trimester.[1]

Headache during pregnancy may be due to a great variety of causes which do not appear to differ materially from the causes of headache at other times. It is best treated by the ordinary symptomatic measures unless some definite cause can be elucidated.

REFERENCE

[1] Greene, R., and Dalton, Katharina (1953). *British Medical Journal*, 1, 1007.

### Loss of Sexual Desire after Oophorectomy

**Q.**—*I have a female patient aged 31 who is married and who, because of endometriosis, had a subtotal hysterectomy and both tubes and ovaries removed 18 months ago. Following the operation, she had a short, sharp menopause and soon lost all sexual desire. She came to ask me if I could give her something to bring back her desire, not just for herself but for the sake of her husband, who, apparently, is rapidly becoming frustrated. I would be grateful if you could advise what treatment should be given and also indicate any dangers of hormone therapy in such cases. She has no other complaints.*

**A.**—The patient should be made to realize that suppression of ovarian function does not necessarily lead to frigidity. Many women think that it does, with the result that the thought becomes more important than the physical state. It could be pointed out that in most women the natural menopause does not ordinarily result in loss of libido. General ill-health, overwork, and preoccupation with other things may be aetiological factors in this case.

Despite the above it must be admitted that certain women do appear to depend to some extent on oestrogens for sex desire. If all else fails, therefore, oestrogens in moderate dosage—say, stilboestrol 1 mg. daily for three weeks followed by an interval of one week—could be given, and, unless the hysterectomy was far from total, it is not likely to cause bleeding from the stump. The main disadvantage of oestrogen in this particular case is that it might reawaken any dormant fragments of endometrioma remaining in the pelvis. The risk is not very great, however, especially if the treatment is given intermittently. Even if there should be renewed activity, no great harm would result, because suspension of treatment would result in its disappearance. It should be recognized too that when oestrogen therapy is ultimately suspended the patient might have menopausal symptoms again.

Testosterone also appears to stimulate sex desire in some women. It does not reactivate endometrioma, but it has the disadvantage that it is likely to cause virilism if given for long in any except minute doses. There are also reports of cortisone increasing libido in both sexes, but this substance has so many possible side-effects that it is scarcely justifiable to give it for this purpose alone.

### Nominal Aphasia in the Elderly

**Q.**—*An elderly lady complains of sudden loss of memory for names of people, plants, objects, etc. The name always returns to her memory, but often too late for her comfort. She is otherwise well. Is this a sign of arteriosclerosis? Her blood pressure is 135/80. Is there any treatment likely to improve her memory?*

**A.**—Sudden inability to recall names quite rightly raises the suspicion of cerebral arteriosclerosis, as mild nominal aphasia may sometimes occur as a sequel to small cerebrovascular accidents without loss of consciousness. Difficulties with names of people, plants, objects, etc., produced in this way are as a rule of transitory nature, clearing up within a few hours or days, but may, for the time being, present the only evidence pointing towards cerebral dysfunction. Often closer examination may reveal other kinds of speech disturbance such as reading or writing difficulties, or a defect in manipulating numbers. These signs or other neurological evidence of a lesion in the dominant hemisphere should be apparent in cases where permanent naming difficulties are the result of vascular or other focal intracranial lesions. Apart from general hygienic measures, there is as yet no causal treatment for arteriosclerotic or senile memory difficulties.

Poor memory for names may be one of the early symptoms of generalized cerebral dysfunction as seen in mild toxic states of elderly people, when it should again be transitory in nature, or at the onset of presenile and senile dementia. However, the symptom then never occurs in isolation, but inquiry will elicit an account of decrease in interest, drive, and ability at job or house-work, and examination is likely to reveal patchy memory-impairment for recent dates and events.

In the vast majority of cases, complaints of poor memory for names are without serious import, as failure of this kind is almost physiological in old age. Like all early "psycho-organic" signs, it is variable, and a sudden difficulty in recalling a name may resolve itself within a few minutes or hours. Sudden awareness of the disability may be produced in an old person by recent loss of security through bereavement or change of surroundings, and may really be part and parcel of a mild agitated or anxious reaction, which may respond to manipulation of the environment.

Finally, one sees from time to time what might almost be called a hypochondriasis of memory, in that the patients complain of inability to recall names, or will in an obsessional fashion persist in giving themselves memory tasks, without there being any objective evidence of memory decline. As a rule, the complaint can be interpreted as a dependency reaction, a partly conscious appeal to be cared for, and it usually occurs in people with lifelong neurotic problems. The choice of symptom is, of course, suspicious of there being some subclinical cerebral involvement, but patients with these complaints have not turned out to be suffering from a progressive dementia.

### Rapid Weight Loss in the Elderly

**Q.**—*Apart from malignant disease and obvious acute illness, what are the most likely causes of rapid loss of weight in elderly people?*

**A.**—The question is difficult to answer without some information to restrict the field of inquiry. If loss of weight was due to subacute bacterial endocarditis or tuberculosis, one would expect fever and an increased sedimentation reaction. If due to toxic goitre, which is easily missed in the elderly, there should be tachycardia; diabetes should give sugar in the urine; and cirrhosis should give a palpable liver, stellate naevi, and changes in the plasma proteins. Emaciation may be due to disorders of the alimentary tract, such as non-malignant disease of the oesophagus, peptic ulcer or steatorrhoea from gastro-colic fistula, pancreatitis, or regional ileitis; in these circumstances one would expect dysphagia, vomiting, or diarrhoea. When there is no change in temperature, pulse, and E.S.R., and no localizing symptom, one would think of conditions such as depression and arteriosclerosis. Surprisingly rapid loss of weight may sometimes occur after trauma, operations, or severe infections.

### Sensitivity of Nipples to Cold Water

**Q.**—*A healthy girl of 17, who is fond of swimming, complains of severe pain in both nipples when they are first immersed in the water. The pain persists for perhaps a minute and then goes completely. On examination the breasts are somewhat small, but the nipples are well developed. Swabbing the nipples with cold water causes them to blanch and to retract slightly. Pain is then felt. As the colour returns to the nipples, so the pain subsides. What is the cause of this pain, and is any treatment possible?*

**A.**—Severe pain of this kind is usually associated with a vascular disturbance in the nipple, and this is borne out in this case by the colour changes noted. The pain is the result of ischaemia, which may be brought about by spasm of the vessel walls but is more likely to be caused by spasm of the involuntary muscle which is distributed throughout the nipple and around its base. This muscle is normally concerned in controlling not only the ducts but also the blood vessels with a view to causing erection of the nipple. The phenomenon described may be regarded as an aggravation of the usual skin reaction to a cold stimulus, and indeed it can sometimes be induced by inserting some remote part of the body such as the hand or foot in cold water.

Undue sensitivity of the nipple to cold is more often seen when the breasts are actively developing, as in early pregnancy. In this case pubertal growth may be a factor, so that the spasms may subside as the girl gets older. Meanwhile treatment is difficult, and, although it is just possible that daily gentle kneeding of the nipples with lanoline cream or an oestrogen ointment might help, it would probably be wise to avoid any treatment which might encourage this young girl to take a morbid interest in her breasts and in her problem.

### Effect of Industrial Oils and Greases on Psoriasis

**Q.**—*What effect has oil or grease, encountered at work, likely to have on patients with psoriasis? Will it exacerbate their condition?*

**A.**—Oil and grease encountered at work do not usually have any adverse effect upon patients with mild or static psoriatic patches. On the other hand it must be remembered that workers who are exposed to oil and grease often have difficulty in removing these after work and must perforce use powerful detergents. These detergents are more likely to be harmful than the original oil and grease. Another factor to be borne in mind is that many workers exposed to oil and grease are employed in machine shops, their jobs being to set and service machine tools used for cutting metal. Under these conditions there is often a serious risk of repeated minor injury from the so-called "swarf" or fine metal filings, slivers, and spirals. It is well known that psoriatic patients will often develop a patch of psoriasis in response to an injury of the skin such as a scratch or even a surgical incision, and consequently they should not be employed in jobs where there is a risk of repeated minor injuries. Patients with more active and generalized forms of psoriasis should not be exposed to oils and greases.

### Grooves on the Nails

**Q.**—*A patient of mine has three grooves and three corresponding ridges on the nails of her big toes. No other nails are affected. The condition has been present for about 18 months. What is the explanation for this phenomenon?*

**A.**—It is presumed that the grooves and ridges run transversely on the nails. The fact that they are present on the big toe nails of both feet makes it less likely that they are due to a local cause, and presumably indicates some systemic upset which has occurred three times, at about the time that part of the nail was first forming. When a ridge reaches about the middle of the nail, it indicates an upset occurring about three months previously. A nail dystrophy from systemic causes would be expected to produce changes in all the nails, but this does not always happen. Another cause to be considered in this case is some vascular disturbance in the legs. Aggravation of a vascular condition by cold, for example, might account for this dystrophy confined to the big toes.

### Mental and Psychological Sequelae of Cerebral Malaria

**Q.**—*Are mental deficiency and abnormalities of behaviour recognized sequelae of non-fatal cerebral malaria?*

**A.**—No.

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**Corrections.**—In the annotation on "Glycogen Storage Disease of the Liver" (*Journal*, July 16, p. 189) the last sentence on p. 190 should have read "Hypoglycaemia not responsive to adrenaline and the hyperglycaemic-glycogenolytic factor of the pancreas (glucagon) would confirm the diagnosis . . ." instead of "Hypoglycaemia not resistant. . . ."

In the paper by Professor C. H. Best and his colleagues entitled "Effects of Dietary Protein, Lipotropic Factors, and Realimentation on Total Hepatic Lipids and their Distribution" (*British Medical Journal*, June 18, p. 1439) there was an error in the quotation at the foot of p. 1443. The last line on that page and the first line on the following page should read ". . . and only occasionally is the fatty infiltration most severe around the central vein of the lobule."

Our report of Dr. C. Langton Hewer's remarks on the Trendelenburg position at the meeting of the Section of Anaesthesia in Toronto should have quoted him as saying that there was a fall in the blood pressure of 2 mm. Hg for every inch vertically above heart level (not a rise of 20 mm.).

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